

***Targets to the Protocol on water and health of the
Convention on the protection and use of transboundary
watercourses and international lakes***

(The Republic of Kazakhstan)

Astana, 2017

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Accepted abbreviations and conventions

| | |
|------------------------------------|--|
| ADB | Asian Development Bank |
| AWU | Association of water users |
| OJSC | Open Joint Stock Company |
| RK | The Republic of Kazakhstan |
| WB | The World Bank |
| WHO | World Health Organization |
| WHO-Euro | The European Regional Office of the World Health Organization |
| EECCA | The states of Eastern Europe, the Caucasus and Central Asia |
| EBRD | European Bank for Reconstruction and Development |
| EU | European Union |
| ECE | Economic Commission for Europe |
| IWRM | Integrated water resources management |
| Convention on transboundary waters | The UNECE Convention on the use and protection of transboundary watercourses and international lakes |
| MFA | Ministry of Foreign Affairs |
| MH | Ministry of Health |
| MNE | Ministry of National Economy |
| MA | Ministry of Agriculture |
| MJ | Ministry of Justice |
| MES | Ministry of Education and Science |
| MF | Ministry of Finance |
| ME | Ministry of Energy |
| MID | Ministry of Investment and Development |
| CGS MID | Committee of geology and subsoil use of the Ministry of investment and development |
| CCH and CS MID | The Committee for Construction and Housing and Communal Services of the Ministry of investment and development |
| CPPH MH | Committee for the protection of public health of the Ministry of Health |
| ДЭІ and MME | Department of Environmental Information and Monitoring of the Ministry of Energy |
| LB | Local budget |
| NDWP | The National Dialogue on Water Policy |
| NLA | Normative legal act |
| NAP | National Action Plan |
| NGO | Non-governmental organization |
| UN | United Nations |
| MPC | Maximum permissible concentration |
| MAR | Maximum Allowable Reset |
| Protocol | The Protocol on Water and Health |
| BN and R | Building norms and rules |
| SN and R | Sanitary norms and rules |
| Standard ISO | Standard of the International organization for standardization |

| | |
|--------|------------------------------------|
| ACP | Agricultural commodity producers |
| FS | Feasibility study |
| SDG | Sustainable Development Goals |
| UNICEF | United Nations Children's Fund |
| UNEP | United Nations Environment Program |
| AI | Acute intestinal infections |
| VHA | Viral hepatitis A |

Introduction

Kazakhstan is known in the world as a country with large reserves of natural resources. Largely due to their availability, the country manages to develop its economic, scientific and cultural potential. At the same time, the volumes of one type of natural resources, namely, water resources, are limited in Kazakhstan. Based on average per capita indicators, Kazakhstan can not be classified as a country with an acute shortage of water resources. But, the uneven distribution of water sources across the country, as well as their irrational use, make it much more difficult to solve the problems of providing the population and the economic complex with water in the required volume and of guaranteed quality.

One of the most important aspects of this common problem is the problem of providing the country's population with drinking water, which has not yet been completely solved in many settlements.

The problem is not new and to some extent has a historical character. It is known that the population of the republic, even in the Soviet years, was not sufficiently provided with drinking water not only in rural settlements, but in large cities. For example, in such regional centers of Kazakhstan as Kyzyl-Orda and Atyrau (Guryev), water was supplied to the population at certain times or did not go up to the upper floors of houses during the day. At the same time, the issue was never put before as a priority task, which, of course, affected the health and life expectancy of the population.

With the acquisition of independence and the improvement of the economic situation, the Government of Kazakhstan has begun to pay close attention to the resolution of this issue. Currently, programs aimed at solving this problem have been adopted and are being implemented, huge financial resources are being allocated to the country. Already there are significant positive results, but the issue is still on the agenda as the most urgent task of our time.

It is known that water resources influence human health not only through eating water, but they are somehow connected with the whole life activity of a person. In particular, water has an impact on human health during bathing, when consuming aquatic organisms grown in ponds, etc. Unlike the problem of providing the population with drinking water, only specialists know about these problems in Kazakhstan as a rule.

The implementation of goals 3 and 6 of the Sustainable Development Agenda for the period to 2030 is closely interlinked with the Protocol on water and health of the Convention on the Protection and use of transboundary watercourses and international lakes.

Taking into account the whole range of issues related to water and its impact on human health, Kazakhstan was conducted with the support of the UNECE Evaluation of the feasibility of the country's accession to the Protocol on Water and Health of the Water Convention, on the basis of which domestic procedures for accession to The Protocol.

Since Article 6 of the Protocol provides for the development of targets for it, at the end of last year, work was begun on their development with the support of the UNECE in the framework of the EU project in Kazakhstan "Support to Kazakhstan for the transition to the green economy model", which are presented in this report.

The projects of the Target indicators have been developed by the experts of Kazakhstan in the field of water supply and sanitation. They were submitted for consideration by a wide range of specialists from state bodies, scientific and design organizations, as well as non-governmental organizations at meetings held on April 29, 2016 in Almaty and May 30-31, 2016

in the village. Borovoe (near Astana). The targets have also been updated to take into account the suggestions and comments of the participants in the meeting on the discussion of the draft targets for Kazakhstan on April 7, 2017 in Kyzylorda.

In this report, the Targets are presented taking into account the comments made at the meetings. At the next stage of the research, it is planned to conduct official procedures for the coordination and approval of the Target Indicators in Kazakhstan.

1. Analysis of the current situation

1.1. Water resources of Kazakhstan and its use

Reserves of fresh water in Kazakhstan are estimated at 524 km³, including 80 km³ in glaciers, 190 km³ in lakes, and 101 km³ of river resources. Reserves of groundwater make 7.6 km³, including: for domestic and drinking water supply - 5.6; for household, drinking and industrial-technical water supply - 0.4; for domestic and drinking water supply together with irrigation of land - 1.3; for household, drinking, industrial and technical water supply and irrigation of land - 0.3.

On the territory of the republic there are about 39 thousand rivers and temporary streams, of which more than 7 thousand have a length of more than 10 km. Most of the rivers of Kazakhstan belong to the internal closed basins of the Caspian and Aral Seas, lakes Balkhash, Alakol and Teniz. Only the Ertis River belongs to the basin of the Arctic Ocean. Всего в Казахстане насчитывается более 48 тысяч озер общей площадью водной поверхности 4500 км² и объемом около 190 км³. Больше всего озер в лесостепной зоне и северной части степной зоны.

Currently, the volume of return water in the country is about 9.0 km³. In this case, their resource part, i.e. returned to water sources, does not exceed 2.0 km³. The main amount of return water flows into the Syrdarya river basin (47%) and the Irtysh river basin (34%), the rest being the Il (8%) and Nura (1%) rivers.

The republic has explored 1,282 groundwater deposits on the state balance sheet. The explored operational reserves of drinking water are more than 2 times higher than the total demand of the republic and amount to 1.12 m³ per day per person. At the same time, development of the reconnoitered groundwater resources is carried out at a low rate, and in recent years has been almost completely suspended in a number of regions of the republic. Many groundwater deposits are not used for 10 to 15 years, and in some cases, the delay in putting them into operation reaches 25 to 30 years. In addition, at present, only 402 deposits are exploited from the total number of explored deposits (1282) (the volume of extracted water is 2.0 million km³ per day), which is 56% of the total balance of drinking water consumption of the population.

Fresh groundwater has a number of significant advantages over surface waters: they are usually higher in quality, better protected from contamination and contamination, their resources are less prone to long-term and seasonal fluctuations.

The Republic of Kazakhstan is rich in mineral waters. 45 deposits in the territory of the country have been explored which, according to their chemical composition, balneological properties and therapeutic value, are conditionally combined into five balneological groups: iodine - bromine (5 deposits), siliceous (4), radon (7), ferruginous (2) and without specific components (27). In addition, 251 promising manifestations of mineral waters have been identified, of which: glandular - 7, radon - 27, siliceous - 15, iodine-bromine - 68, radon - siliceous - 1, hydrogen sulfide - 1, arsenic - 1, without specific components and properties - 132.

In Kazakhstan, there are significant hydrothermal resources that have spread within the deep depressions formed by sedimentary formations. These include artesian basins: the Caspian, Mangyshlak-Ustyurt, Tobolsk, Irtysh, Torgai, Sirdarya, Shu-Sarysu, Zaisansky, Iliyskiy and Balkhash-Alakolsky rivers with groundwater, the temperature of which exceeds 30-400 ° C. In some depressions, the water temperature reaches 100 and more degrees. Natural reserves of

hydrothermal resources of Kazakhstan are estimated by the following values: 10275 km³ - water resources, 679820 mln Gcal - heat resources and 97115 mln tonnes - conditional fuel resources. Practical use of thermal waters is still insignificant, but the prospects for their application are large.

On the territory of Kazakhstan is concentrated a large number of lakes of isors, many of which contain therapeutic mud. At 31 sites, estimated operational reserves of therapeutic mud in the amount of 30915.1 thousand m³.

In general, over the past five years, the volume of annual water consumption in all sectors of the economy has averaged 22.5 km³ over the country, and 95% due to surface water. The main share of water use falls on agricultural production - more than 60% of the total water consumption in the country (Table 1.1).

Table 1.1
Use of water resources (2010-2014), million m³

| Main indicators | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|----------------|----------------|----------------|----------------|----------------|
| Number of water users | 5134 | 4839 | 4589 | 4733 | 4596 |
| Collected water, total | 23811,7 | 21947,7 | 21389,5 | 22530,5 | 23265,5 |
| <i>including surface water</i> | 22625,3 | 20810,8 | 20256,8 | 21455,1 | 22214,5 |
| <i>including - underground</i> | 842,2 | 839,7 | 789,8 | 865,6 | 884,1 |
| Loss of water during transportation | 2640,0 | 3707,8 | 3512,2 | 3556,5 | 2854,5 |
| Using the water, total | 20856 | 19232,3 | 18402,9 | 20063,5 | 20410,9 |
| <i>including for needs:</i> | | | | | |
| <i>- household drinks</i> | 751 | 790 | 724,4 | 710,6 | 730,9 |
| <i>- production</i> | 5357 | 5173,2 | 5240,5 | 5477,4 | 5591,8 |
| <i>- regular irrigation</i> | 8732,5 | 8763,3 | 8692,9 | 9172,1 | 9393,7 |
| <i>- Irrigation irrational</i> | 2654,9 | 302,6 | 146,6 | 313,8 | 310,0 |
| <i>- agricultural supply</i> | 209,4 | 208,6 | 202,9 | 192,6 | 190,0 |
| <i>- watering of pastures</i> | 106,1 | 98,1 | 98,4 | 95,1 | 91,4 |
| <i>- pond fish industry</i> | 275 | 230,1 | 269,8 | 56,9 | 45,0 |
| <i>- other needs</i> | 2770,1 | 1244,6 | 1766,9 | 1727,8 | 1940,6 |
| Water diversion, total | 7224 | 7129,5 | 6840,4 | 7599,1 | 8688,5 |
| Including: | | | | | |
| <i>a) in surface water bodies</i> | 5113 | 6273,6 | 5653,5 | 6988,4 | 7627,6 |
| <i>from them without cleaning</i> | 205,7 | 170,7 | 153,5 | 136,1 | 152,6 |
| <i>normative - pure</i> | 4585 | 5573,9 | 5936,9 | 6257,3 | 6730,8 |
| <i>b) normatively purified</i> | 257,1 | 259,4 | 245,6 | 242,1 | 270,6 |
| <i>c) in the stores for the relief of places.</i> | 2111 | 855,8 | 1186,9 | 610,6 | 605,2 |
| Turnover water supply | 7126,3 | 6844,3 | 7556,5 | 7665,3 | 7691,2 |
| Repeated water supply | 902,02 | 813,3 | 751,9 | 689,5 | 723,5 |

The water abstraction for agriculture in 2014 was 14.8 km³, of which 9.3 km³ was used for regular irrigation on an area of 1.4 million hectares, and the remaining 2.5 km³ were used for the needs of liman irrigation, haymaking and pasture flooding, 2.8 km³ were water losses during transportation.

In general, for the period from 2009 to 2014, specific water consumption for agricultural needs decreased from 9067 m³ / ha to 8587 m³ / ha.

The use of water saving technologies for water supply and irrigation (drip, sprinkler, discrete) in agriculture makes up less than 7% of the irrigated lands used or 95.8 thousand hectares.

The industrial sector of Kazakhstan consumes an average of about 5.1 - 5.5 km³ of water with a water intake of 5.8 - 6.2 km³, or about 20-23%. The volume of irretrievable consumption is 0.9 - 1.5 km³ per year or about a third of the total water intake. At the same time, only about

20% of industrial enterprises use technologies of recycling water supply. The largest share in the water intake are enterprises of heat power engineering, non-ferrous metallurgy, and oil industry.

In many branches of industrial production and in individual enterprises, due to the low level of use of circulating and re-supplying water, inadequate compliance with water-saving and waterless technologies, unsatisfactory condition of water supply systems and their low efficiency, high fresh water costs per unit of output remain.

Hydroenergy construction has been developed mainly in the Ertis and Ile-Balkhash basins, where practically all technologically possible hydropower resources of the republic, 40 and 20 TWh respectively, are concentrated. Currently, only about 10% of the technical hydropower potential is used in the republic. Hydropower significantly changes the regime of river flow, which adversely affects the following water users and water users.

River navigation was developed in the Ertis, Zhayik-Caspian and Ile-Balkhash basins, that is, on the largest rivers of the republic. The requirements of water transport to the use of river flow are to maintain navigable depths on rivers during the navigation period.

A major consumer of water is the fishery. Fisheries require water releases in order to maintain a certain hydrological regime on spawning grounds and migration routes of producers and young, and also to maintain water, salt and hydrobiological regimes in fishery water bodies.

Water is also widely used for recreational purposes - recreation. The vast majority of institutions of short-term and long-term rest, more than half of tourist institutions and sanatoriums are located on the banks of water bodies. The use of recreational water bodies places high demands on water quality and on the hydrological regime of water bodies (temperature, level regime, flow rates, etc.). Like other water users, recreation also requires the landscapes of the coastal strip, the climatic conditions of the area, the size and configuration of the reservoirs, proximity to places of settlement and transport accessibility.

1.2. Water quality

The level of surface water pollution is estimated from the value of the integrated water pollution index (WPI), which is used to compare and detect the dynamics of water quality changes.

For the period from 2011 to 2014, the number of water bodies, where surface water quality of Kazakhstan was monitored, increased from 88 to 107.

In 2014, compared to 2013, the number of water bodies with the class "clean" has decreased compared to 25 to 18. During the same period, the number of water bodies with a class of water "very dirty" from 1 to 3 increased.

On water objects of East Kazakhstan, Karaganda, Aktyubinsk and Zhambyl oblasts water pollution by heavy metals, biogenic and organic substances is noted.

Water pollution with manganese, nickel, iron is noted in the Tobol River basin, high mineralization is noted in the mountain rivers of the Ile River - copper, fluorides, in Balkhash - Alakol systems of lakes and lakes of the Shchuchinsk-Borovo resort zone.

In total, 12 rivers, 2 reservoirs, 1 canal, 1 sea: the Kara Ertis (EKO), Ertis (EKO), Buktyrma, Oba rivers, the Kara river, Ural (WKO), Ayat, Shilik, Sharyn, Karkara, Turgen, Temirlik, KattaBugun; water reservoirs: Ust-Kamenogorsk, Buktyrma; Canal: Kushum; Sea: The Caspian Sea.

To the class "moderately polluted" - 33 rivers, 5 reservoirs, 5 lakes, 1 canal, 1 sea: the rivers Breksa, Ulba, Emel, Ertis (Pavlodar region), the Sharonovka, Kigach, Ural (Atyrau region), Emba (Atyrauskaya), Chagan, Derkul, Ory, Kargala, Yesil, Kettybulak, Nura (Akmola region), Ile, Esentai, Tekes, Korgas, Ulken Almaty, Kishi Almaty, Bayankol, Kaskelen, Esik, Talgar, Talas, Shu, Assa, Aksu, Sargou, Badam, Arys, Syrdarya (Kyzylorda oblast), lakes: Ulken Almaty, Zerenda, Maly Aral, Karasie, Sulukol, Balkhash; reservoirs: Kapshagai, Sergeevskoe, Astana, Kurtinskoe, Bartogai, Nura-Yesil canal.

The class of "**contaminated**" water includes the following water bodies:

- rivers: Silent, Glubochanka, Emba, Temir, Irgiz, Karakhobda, Actors, Ak - Bulak, Sary - Bulak, Zhabai, Toktash, Karabalty, Keles, Syrdarya (within the South Kazakhstan region);
- Lakes: Shalkar (Aktobe region), Shalkar (West Kazakhstan region), Sultankeldy, Kopa, Burabai, Ulken Shabakty, Shortan; the Ertis-Karaganda Canal;
- Reservoir Shardarinskoe.

The following water bodies are classified as **"dirty"** water:

- the Ilek River (within the Aktyubinsk Oblast), Kosestek, Bolshaya Khobda, Togyzak, Nura (within the Karaganda Oblast);
- Lake Biylikol, Kishi Shabakty;
- reservoirs: Samarkand and Kengir.

To the class of **"very dirty"** water-rivers Krasnyarka, Tobol, Will.

To the class of **"extremely dirty"** water - the Cherubaynur and Kara-Kengir rivers.

Under the program "Environmental monitoring", surface water quality is monitored on 29 transboundary rivers. There is an exchange of hydrochemical information (data) for hydrological posts on transboundary rivers under signed agreements with China (since 2001), Russia (1992). Data are exchanged in accordance with the approved regulations on joint monitoring of transboundary rivers.

Chemical analysis of radionuclides and macro - microelements on 15 transboundary rivers, coastal soils and bottom sediments is carried out as part of the "Monitoring of transboundary toxic components transfer" program under the "Environmental Monitoring" program.

In the table 1.2. data on cases of high pollution of surface waters of transboundary rivers for the period from 2011 to 2014 are given.

Table 1.2.

Cases of high pollution of surface waters of transboundary rivers for the period from 2011 to 2014

| Name of water body, region | Number of cases | | | | Contaminants |
|-------------------------------------|-----------------|--------|--------|--------|---------------------------|
| | 2011r. | 2012r. | 2013r. | 2014r. | |
| the Tobol River (Kostanay) | 3 | 4 | 2 | 7 | Manganese, copper, nickel |
| the Togyzak river (Kostanay) | 5 | 7 | 2 | 2 | Nickel |
| Ayat river (Kostanay) | 2 | 4 | 2 | 3 | Manganese, nickel |
| the river Ubagan (Kostanay) | | 1 | 1 | 3 | Manganese, nickel |
| the river Ui (Kostanai) | | 2 | 2 | 2 | Manganese, nickel |
| The river Ory (Aktobe) | | | 2 | | Copper, zinc |
| the river Ilek (Aktobe) | 7 | 7 | | | Bor |
| the Chagan River (WKO) | 1 | | | | Dissolved oxygen |
| the Great Uzen River (WKO) | 1 | | | | Dissolved oxygen |
| the Ural River (WKO) | 1 | | | | Dissolved oxygen |

The main sources of surface water pollution in the Balkhash-Alakol, Ertis and Tobyl-Torgai oblasts are heavy industry (mining of metals and steel production, and refining), in other river basins, the main source of pollution is agriculture.

According to the General Scheme of Integrated Use and Protection of Water Resources of the Republic of Kazakhstan, polluting industries annually discard about 50% of water without treatment, which means 1.5-2 billion m³ of untreated sewage per year. Due to the backlog in the availability of sewerage and the lack of secondary sanitation in Kazakhstan, only 29% of the sewage water in settlements before the discharge is secondary cleaned (in the UK 94%, Israel and Singapore 100%).

The quality of river water depends not only on the organized wastewater discharges, which are under constant monitoring by all monitoring organizations, and also to a considerable extent from the surface washout into the water sources of various industrial wastes (dumps of

overburden rocks, ash dumps), from the territories of settlements, chemicals, washed away from the fields. Therefore, it is also necessary to implement measures to intercept and clean storm sewage.

According to the Department of Sanitary and Hygienic Monitoring and Risk Assessment of the RSE on the REM "Scientific and practical center for sanitary and epidemiological expertise and monitoring" of the Ministry of health of the RK (candidate of medical sciences Tastankayev SO) water quality of reservoirs I (for domestic and drinking water supply) and II (for cultural purposes) of the 2015 category are shown in Tables 1.3 and 1.4, respectively.

Table 1.3.

Water quality of I-category water bodies in 2015
(for domestic and drinking water supply)

| Name of regions | Sanitary and chemical indicators | | | Microbiological indicators | | |
|-----------------------------------|----------------------------------|---|-------|----------------------------|---|------|
| | Sample studies | Of these, not corresponding to the standards. | % | Sample studies | Of these, not corresponding to the standards. | % |
| The Republic of Kazakhstan | 825 | 178 | 21,6 | 809 | 93 | 11,5 |
| Akmola | 12 | 1 | 8,3 | 46 | 11 | 23,9 |
| Aktobe | 0 | 0 | 0,0 | 0 | 0 | 0,0 |
| Almaty | 42 | 2 | 4,8 | 42 | 1 | 2,4 |
| Atyrau | 226 | 28 | 12,4 | 229 | 50 | 21,8 |
| EKO | 55 | 2 | 3,6 | 67 | 0 | 0,0 |
| Zhambyl | 0 | 0 | 0,0 | 10 | 0 | 0,0 |
| WKO | 155 | 37 | 23,9 | 170 | 2 | 1,2 |
| Karaganda | 81 | 29 | 35,8 | 109 | 0 | 0,0 |
| Kostanay | 69 | 0 | 0,0 | 0 | 0 | 0,0 |
| Kyzylorda | 31 | 31 | 100,0 | 31 | 9 | 29,0 |
| Mangistau | | | 0,0 | | | 0,0 |
| Pavlodar | 17 | 0 | 0,0 | 17 | 0 | 0,0 |
| NKO | 0 | 0 | 0,0 | 0 | 0 | 0,0 |
| SKO | 110 | 45 | 40,9 | 63 | 20 | 31,7 |
| Almaty city | 0 | 0 | 0,0 | 0 | 0 | 0,0 |
| Astana city | 26 | 3 | 11,5 | 24 | 0 | 0,0 |
| DCP in transport | 1 | 0 | 0,0 | 1 | 0 | 0,0 |

Table 1.4.

Water quality of I-category water bodies in 2015
(for cultural and domestic purposes)

| Sanitary and chemical indicators | | | Microbiological indicators | | |
|----------------------------------|---|------|----------------------------|---|------|
| Sample studies | Of these, not corresponding to the standards. | % | Sample studies | Of these, not corresponding to the standards. | % |
| 3814 | 556 | 14,6 | 3085 | 466 | 15,1 |

According to the Committee of Public Health Protection (Ministry of Health of the Republic of Kazakhstan - authorized body for sanitary and epidemiological well-being), the reasons that affect the quality of water in open water bodies are also:

- non-observance of the size of water protection zones,
- the formation of natural household dumps,
- drains of industrial and agricultural facilities,
- accommodation of residential and industrial facilities on the banks of riverbeds without agreement with the bodies of the sanitary and epidemiological service,
- accidents on sewer networks and others.

1.3. Regulatory framework

By the Decree of the President of the Republic of Kazakhstan dated January 31, 2017 №415, the main directions of the state policy of the Republic of Kazakhstan in the field of official development assistance for 2017-2020 were approved. The purpose of the document is to identify the main goals, principles and directions that should be followed in the Republic of Kazakhstan to strengthen its position as a donor, increase the recognition and effectiveness of the assistance provided to development and fulfill its international obligations.

In accordance with the Strategy "Kazakhstan 2050" this will help to strengthen confidence in Kazakhstan and demonstrate its commitment to solving global and regional problems.

The main directions of the state policy of the Republic of Kazakhstan in the sphere of official development assistance (hereinafter referred to as the "ODA") correspond to the goals and directions of the national foreign policy, economic and security policy, as well as the internationally agreed development goals and principles, combining national interests and international obligations.

The creation of a national ODA system actually lays the foundation for a completely new field of economic activity in the Republic of Kazakhstan - the field of international development. Creation of such a field of activity allows to inventory and systematize experience in various fields of activity, knowledge and competitive advantages of the Republic of Kazakhstan, and also provides an incentive for the development of those areas and the potential that are still insufficiently developed or absent in the country.

Based on its previous experience in both development assistance and humanitarian assistance, Kazakhstan has taken concrete steps to create an institutional, legislative and strategic framework for the national ODA system. The adoption of the Law of the Republic of Kazakhstan of 10 December 2014 "On official development assistance" (hereinafter referred to as the Law) laid the institutional basis of the Republic of Kazakhstan ODA system, which consists of the Ministry of Foreign Affairs of the Republic of Kazakhstan (hereinafter - the Ministry of Foreign Affairs), an operator in the field of ODA (Kazakhstan Agency assistance to international development of "KazAID") and branch ministries.

The strategic base of Kazakhstan's ODA is based on the Constitution of the Republic of Kazakhstan, the Strategy "Kazakhstan-2050" (the Message of the President of the Republic of Kazakhstan to the people of Kazakhstan on December 14, 2012), the Concept of the foreign policy of the Republic of Kazakhstan for 2014-2020, the Plan of the Nation - 100 concrete steps for implementation five institutional reforms, the Charter of the United Nations, the United Nations Millennium Declaration and other international documents in the field of development assistance, as well as on relevant international experience.

Water legislation of the Republic of Kazakhstan is based on the Constitution of the Republic of Kazakhstan and consists of the Water Code and other regulatory legal acts of the Republic of Kazakhstan.

Water legislation is based on the principles of recognizing the state importance of waters, which are the basis of life and activity of the population; priority provision of the population with drinking water in the required quantity and quality assured; fair and equitable access of the population to water; integrated and rational use and protection of water.

Relations arising in the provision of environmental, sanitary and epidemiological safety of water bodies, prevention of harmful impacts of economic and other activities on natural water ecological systems related to the Protocol on Water and Health are governed by the following legal acts and regulatory documents:

- 1) Water Code of the Republic of Kazakhstan of 09.07.2003;
- 2) The Environmental Code of the Republic of Kazakhstan dated January 9, 2007;
- 3) the Code of the Republic of Kazakhstan "On the health of the people and the health care system" of september 18, 2009 No. 193-IV;
- 4) Law of the Republic of Kazakhstan "On subsoil and subsoil use" of June 24, 2010 . №291-IV;
- 5) The Law of the Republic of Kazakhstan "On architecture, urban planning and construction activities in the Republic of Kazakhstan" of july 16, 2001, № 242;
- 6) the Code of the Republic of Kazakhstan "On administrative offenses" of July 5, 2014 No. 235-V;
- 7) Land Code of the Republic of Kazakhstan of June 20, 2003 No. 442;
- 8) Law of the Republic of Kazakhstan "On civil protection" of April 11, 2014;
- 9) Technical Regulations "Requirements for drinking water safety for the public", approved by the decree of the government of the Republic of Kazakhstan dated May 13, 2008 No. 456;
- 10) Rules for referring a water body to sources of drinking water supply, approved by the order of the Minister of national economy of the Republic of Kazakhstan of November 28, 2015, No. 739;
- 11) Rules for the establishment of water protection zones and bands approved by the order of the Minister of agriculture of the Republic of Kazakhstan dated May 18, 2015 No. 19-1 / 446;
- 12) Rules for the development, approval and approval of the requirements of regulatory, technical, sanitary-epidemiological and metrological support for water control and accounting, approved by the Order of the Minister of Agriculture of the Republic of Kazakhstan dated June 1, 2015 No. 19-2 / 508;
- 13) Sanitary rules "Sanitary and epidemiological requirements for water sources, water intake points for household and drinking purposes, domestic and drinking water supply and places of cultural and domestic water use and safety of water bodies" approved by the order of the Minister of National Economy of the Republic of Kazakhstan dated March 16, 2015 No. 209 ;
- 14) Sanitary-epidemiological rules and norms "Sanitary and epidemiological requirements to ensure radiation safety of drinking water", approved by the order of acting. Minister of Health of the Republic of Kazakhstan of May 15, 2007;
- 15) Rules for the use of water supply and sanitation systems in settlements, approved by Order No. 163 of the Minister of National Economy of the Republic of Kazakhstan of February 28, 2015;
- 16) Rules for leasing and trust management of water facilities that provide water supply to cities and rural settlements, approved by the order of the Minister of National Economy of the Republic of Kazakhstan of July 21, 2015, No. 555;
- 17) Sanitary rules "Sanitary and epidemiological requirements for the organization and conduct of sanitary and anti-epidemic (preventive) measures for the prevention of especially dangerous infectious diseases" approved by the order of the Minister of National Economy of the Republic of Kazakhstan on February 25, 2015, No. 136;

18) Sanitary rules "Sanitary and epidemiological requirements for the organization and conduct of sanitary and anti-epidemic (prophylactic) measures in relation to patients with infectious diseases against which preventive vaccinations are carried out", approved by the order of the Minister of National Economy of the Republic of Kazakhstan on 17.03.2015, No. 215 (regarding vaccination against VG "A", the use of anti-shigellosis bacteriophages, etc.);

19) The rules for registration, keeping records of cases of infectious, parasitic, occupational diseases and poisonings and the rules for reporting on them, approved by Order No. 451 of the Minister of National Economy of the Republic of Kazakhstan of June 24, 2015;

20) Sanitary rules "Sanitary and epidemiological requirements for the organization and conduct of sanitary and antiepidemic (preventive) measures for the prevention of infectious diseases", approved by the order of the Minister of National Economy of the Republic of Kazakhstan on March 12, 2015, No. 194;

21) Rules for the development and approval of standards for maximum permissible harmful impacts on water bodies approved by the Order of the Minister of Agriculture of the Republic of Kazakhstan dated May 15, 2015 No. 19-1 / 441;

22) The rules for maintaining state records of water and their use, the state water cadastre and state monitoring of water bodies, approved by the acting acting president. Minister of Agriculture of the Republic of Kazakhstan of July 31, 2015 No. 19-1 / 718;

23) The methodology for determining emission standards in the environment, approved by the Order of the Minister of Environmental Protection of the Republic of Kazakhstan dated April 16, 2013 No. 110-Г and a number of other normative legal acts.

24) In order to solve the problems in this sector in a consistent manner, a number of national programs and development plans have been developed within the framework of the nationwide action plan for the implementation of the Head of State's message to the people of Kazakhstan on January 17, 2014, "Kazakhstan way - 2050: common goal, common interests, single future ":Стратегический план развития Республики Казахстан до 2020 года, утвержденный Указом Президента Республики Казахстан № 922 от 1 февраля 2010 года;

25) The state program of infrastructural development "Nurlyjол" for 2015 - 2019, approved by the Decree of the President of the Republic of Kazakhstan dated April 6, 2015 No. 1030;

26) The state program of industrial-innovative development of the Republic of Kazakhstan, approved by the Decree of the President of the Republic of Kazakhstan No. 874 of August 1, 2014;

27) The State Health Development Program of the Republic of Kazakhstan "Densauly" for 2016 - 2019, approved by the Decree of the President of the Republic of Kazakhstan of January 15, 2016 No. 176;

28) State program of water resources management in Kazakhstan, approved by the Decree of the President of the Republic of Kazakhstan dated April 4, 2014 No. 786;

29) The State Program for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2017-2021, approved by the Decree of the President of the Republic of Kazakhstan No. 420 of February 14,

30) The state program "Information Kazakhstan 2020", approved by the Decree of the President of the Republic of Kazakhstan dated January 8, 2013, No.464;

31) The program for the development of regions until 2020, approved by the Government of the Republic of Kazakhstan of June 28, 2014, No. 728

32) Also 32 GOST (state standards) and 20 ST (standards) of the Republic of Kazakhstan

1.4. The state of the water supply infrastructure, water disposal and sanitation

The main strategic document in the field of water resources management, their integrated use and protection is the State Water Management Program of Kazakhstan. This program also covers water supply and sanitation in a broad aspect, including those of interest from the point of view of the Protocol under consideration.

The program defines four groups of target indicators:

- 1) ensuring better water use efficiency;
- 2) reduction of the water deficit, both at the national and regional levels;
- 3) providing access to drinking water, wastewater treatment and improving the quality of water resources;
- 4) improvement of the water resources management system.

The third group defines target indicators of interest in the context of the Protocol on water and health:

- the share of water users with constant access to the central drinking water supply system of at least 100% in 2020;
- the proportion of households with access to sewerage networks is at least 100% in 2020 in urban areas, as well as at least 20% in 2020 and at least 50% in 2040 in rural areas;
- until 2020 in operation, a system of regular sampling of water and sewage - no less than 12 samples per year, for cities with a population of more than 100 thousand people. - not less than 24 samples per year.

Resolution of the Government of the Republic of Kazakhstan dated May 5, 2014 No. 457 approved the Action Plan for its implementation for 2014-2020.

Improving the state of water supply and sanitation in the Republic of Kazakhstan is currently being implemented in the framework of the mechanism for the development of water supply and sanitation systems in the Program for the Development of Regions approved by the Decree of the Government of the Republic of Kazakhstan on June 28, 2014 No. 728.

In accordance with the mechanism of the Program for the period up to 2020, the development of the water supply and sanitation sector will be carried out in the following areas:

- 1) introduction of the system approach for the construction of new water supply and sanitation facilities and reconstruction of existing ones;
- 2) increasing the investment attractiveness of the water sector of water supply and sanitation and maximizing the involvement of private capital in financing water supply and sanitation facilities; step-by-step transfer of water supply and sanitation enterprises in urban and rural areas on the model of public-private partnership;
- 3) improvement of the normative legal and regulatory framework in the field of water supply and sanitation, the development of standard projects and model design solutions, the introduction of a unified technical policy for the creation and operation of water supply and sanitation systems;
- 4) maximum use of the potential of groundwater to provide the population with drinking water;
- 5) improving the design quality of the water supply and sanitation system and the development of Kazakhstan content in the water supply and sanitation sector;
- 6) personnel support of the industry.

1.4.1. The situation with water supply in urban areas

At present, there are certain problems with providing the population with drinking water in the cities of the republic.

According to the Committee on Construction and Housing and Communal Services as of January 1, 2016, the urban population has a centralized water supply of 87%.

According to the level of population access to centralized water supply systems, the Republic of Kazakhstan is inferior to developed countries, in which this figure is 90-95%.

According to the Committee for Construction and Housing and Communal Services, most of the water supply networks are in unsatisfactory condition, based on their regulatory deadline for reliable operation. Therefore, because of the corrosion that occurs, water lines and water supply networks are subject to deterioration and overgrowth, which has led to a decrease in their capacity, an increase in the number of accidents, water losses and a deterioration in the quality of drinking water.

One of the strategic goals in the sphere of housing and communal services is to bring the level of regulatory losses in the transportation of water by 2020 - up to 15%.

At the same time, the task is to organize a full instrumentation of water from a water intake from sources to consumers. Reliable water accounting data will show the level of decrease or increase of water losses during its transportation. This measure can allow to reduce excess losses in the water balance of water supply enterprises by 2-3 times.

The existing modern technologies for organizing the archiving of water consumption readings are combined with the possibilities to remotely take readings for stationary or portable equipment of subscriber services, which provides the basis for the introduction of automated water metering systems at enterprises. The transition to new technologies for water accounting has already begun to be carried out by operating water supply companies in the cities of Astana, Almaty, Shymkent, Karaganda, and others.

1.4.2. The situation with rural water supply

According to the data of the Ministry of Agriculture of the Republic of Kazakhstan, out of 6,943 rural settlements (RS), 3592 with a population of about 3 million people or 40% of the total rural population are classified as unsecured by centralized drinking water supply (problematic). These RS are grouped into 4 categories and are given in Table 1.5.

Table 1.5

SR categories not provided with centralized drinking water supply

| № | SR categories | Number of SR | Specific gravity, % |
|-----------|---|---------------------|----------------------------|
| 1. | Using imported water | 134 | 3,7 |
| 2. | Requiring connection to group water supply | 386 | 10,7 |
| 3. | Group water pipelines (reconstruction and construction) | 114 | 3,2 |
| 4. | With a decentralized water supply system | 2958 | 82,4 |

The main reason for this situation is the lack of a systematic approach and due interaction of central and local executive bodies in planning the development and modernization of water supply systems.

Financing from the republican and local budgets was not always carried out in accordance with priorities. As a result, in some cases, the facilities constructed for significant budgetary funds were idle, while others, because of lack of funding, were reconstructed only in small parts.

According to development plans, the target program for access to centralized water supply for the rural population is set to 62% by 2020 as part of the "Development of the Regions" program.

An analysis of the state of the issue indicates that one of the limiting factors in the provision of drinking water to the rural population is the lack of operational enterprises in rural areas or their insufficient material and technical equipment.

1.4.3. The situation with water disposal in urban areas

According to the Committee on Statistics of the Ministry of Education and Science of the Republic of Kazakhstan, there are 186 water disposal enterprises in the urban area with a total length of 12,456 kilometers of networks in need of repair - 8712 kilometers or 70%.

The range of connections to the sanitation infrastructure in the cities is very wide - from 12% in the city of Ayagoz, to 98% in the city of Satpaev. In the regional centers and cities of Astana and Almaty, 60-94% of the population is connected to water disposal systems. At the same time, the share of the total area of the urban housing stock with water disposal on average in the country is 73.4%.

In 39 cities and large SNPs there are no treatment facilities at all, accordingly, the discharge of sewage is carried out without purification.

Of the total volume of wastewater treated, up to regulatory requirements 64.0% are reported, the remaining 36.0% of untreated effluents are discharged to so-called filtration fields, as in the city of Taraz, to storage tanks in the cities of Kokshetau, Uralsk, Petropavlovsk, Kostanay.

Many existing treatment plants have already developed their operational resources and require repair, others - they work with overload, which leads to a discrepancy in wastewater treatment technology design data. So, in the cities of such regions as - Kyzylorda, Mangistau, North Kazakhstan, East Kazakhstan, the percentage of water that is not cleaned up to the normative requirements ranges from 39 to 72%. This indicates that existing treatment facilities are not working efficiently.

The accumulators of treated wastewater are often filled to the maximum levels, there is a constant threat to water bodies and settlements, emergency breakthrough of fencing dams. The consequence of the deterioration of the fixed assets of the drainage networks is a high level of accidents.

A significant amount of waste water from industrial enterprises comes directly to urban wastewater treatment plants, which are not designed for industrial wastewater treatment. Recently, concentrations of detergents have increased in domestic wastewater, which are difficult to clean and have a long period of conservation of harmful effects on the natural environment and, accordingly, pollute water sources.

According to environmental authorities, 50% of sewage discharged by large industrial enterprises do not meet the requirements, the concentration of harmful substances in wastewater discharged into the drainage systems of settlements exceeds the maximum permissible standards. In general, depreciation of fixed assets of sewerage systems in most settlements of the republic is 40-70%, and in some it reaches 100%.

1.4.4. The situation with rural water disposal

According to the Committee on Statistics, 163 enterprises with sewerage networks with a total length of 2,075.5 kilometers operated in rural areas at the time of completion of the "Drinking Water" program (2010), while 1452 kilometers were in need of repair.

The specific weight of the total area of rural housing stock with water disposal on average in the country is 8.8%. Of the total volume of wastewater in rural settlements, 45.4% are cleared to regulatory requirements, the remaining 54.6% are untreated sewage.

Previously, drainage systems were built primarily in district centers and larger rural settlements. Moreover, the drainage of sewage was carried out only from administrative buildings, schools, hospitals and multi-storey buildings. At the present time, this state of affairs with water disposal continues to exist. In many rural settlements the export (sewage) waste disposal system prevails, the sewage (melt) is represented by a small percentage - within 3-5%.

It is expected that the sanitary condition of the settlements, taking into account the forthcoming costs for water supply, can be improved at the first stage without the establishment

of centralized sewerage systems, by constructing local treatment facilities, septic tanks at public and production facilities.

1.4.5. The status of water purification facilities in water supply and water disposal (sanitation)

Most of the treatment plants, especially in small towns (both water supply systems and drainage systems) are currently in poor quality, technological equipment does not work well, or does not work at all. During the entire period of operation of these complexes, they were not repaired, nor upgraded. In the event of a failure of the process equipment, entire blocks automatically dropped out of the cleaning scheme, which gradually came to a neglected and emergency state.

Built many years ago, purification systems in the water supply and sanitation systems of our cities today are in an unsatisfactory technical condition.

There are many reasons for this, the main ones are as follows.

1. When designing, the goals, tasks and possibilities of technological schemes for treatment complexes were not sufficiently fully defined.

2. The quality of construction was extremely low. This is reflected in non-compliance (violation and retreat) of design solutions, in the use of poor-quality materials and process equipment, non-compliance with construction and installation work. The commissioning of facilities, in most cases, was carried out without their preliminary adjustment by specialized organizations, the commissioning of separate blocks of structures was carried out with incompleteness of the construction of the entire complex, which, as a rule, breaks the technological sequence of processes and reduces the efficiency of cleaning the entire complex.

3. Absence in the services of enterprises operating water and sewage treatment facilities of technologists who are able to evaluate technological processes and make adequate decisions to manage them. One of the reasons for the ineffective operation of treatment plants should be considered the lack of operating procedures for the operation of treatment facilities. Violations of technological modes of operation of individual structures, which have a cumulative character, in the final case, lead to a loss of the efficiency of the treatment complexes as a whole.

Modern scientific and production-technical developments put forward new technological schemes and technological solutions in the field of natural and sewage treatment and sediment processing. However, with the previous approaches to their application and solution, in general, issues in the management of them, we can get what we have now.

Without removing from the agenda the relevance of issues of design, construction, commissioning and commissioning of treatment facilities for water supply and water disposal systems, special importance in their subsequent effective work should be devoted to the problems of the organization of operation and management of technological processes that are carried out at these facilities.

Complexes of treatment facilities have a special and very important role in water supply and sanitation systems. They are charged with the task of producing quality drinking water, sewage treatment in accordance with modern standards; processing, use and disposal of sewage sludge in the face of increasing requirements of environmental legislation.

1.4.6 Morbidity associated with water

Water is one of the main factors in the spread of infectious diseases. The waterway of transmission is characteristic for cholera, typhoid fever, dysentery, leptospirosis, tularemia, infectious hepatitis, adenovirus infection, tuberculosis and helminthiases. Drinking water is also the cause of some noncommunicable diseases among the population.

The quality of water in water bodies and drinking water in centralized water supply systems is regulated by the requirements set out in the sanitary regulations "Sanitary and

epidemiological requirements for water sources, water intake points for household and drinking purposes, domestic and drinking water supply and places of cultural and household water use and safety of water bodies" .

In actual conditions, water sampling is usually limited to water treatment facilities. Systematic and regular selection of water to determine its quality in homes or in the water supply network is not regularly carried out. Expert reports indicate that there are inconsistencies in the quality of tap water. For example, according to the International Institute of Green Growth, only 1% of drinking water in Kazakhstan is in line with accepted norms. This is mainly due to the unsatisfactory condition of the water supply network infrastructure and excessive chlorination. At the same time, public sources do not provide data on the quality of drinking water to the general public.

According to sanitary and chemical indicators, the average republican indicator was in the Akmola (16.1%), Kyzylorda (8.2%), Atyrau (28.6%), Aktobe (5.8%), North Kazakhstan (5, 5%), Mangistau (5.2%) and West Kazakhstan (4.1%) regions.

The quality standards of the European Union and the United States can be used as a basis for bringing Kazakhstan drinking water quality standards in line with the world standards for drinking water quality (mainly in the field of frequency standards for quality monitoring).

In the USA, the standards require the control of 87 parameters, while for each of them the maximum permissible level of concentration is established; these levels are reviewed at least once every 6 years. In addition, 15 additional parameters are regularly monitored.

EU regulations set the upper limits for 44 parameters, and at the same time it is necessary to ensure their compliance to the point of delivery (for example, the meter). The EU and the US have set strict standards with regard to the method and frequency of monitoring drinking-water quality. In the United States, drinking water treatment plants are regularly monitored by laboratories certified by the Environmental Protection Agency, and fines are imposed for non-compliance with standards. In the EU, drinking water quality standards and frequency of monitoring depend on the capacity of drinking water treatment plants (at least 4 samples per year and 3 more samples for every 1000 m³ per day of supplied water) and their compliance is monitored by national or regional water quality authorities.

Ensuring the quality of drinking water and its control directly in the pipeline water supply systems in Kazakhstan is the most important task.

The quantity of regulated indicators in the Republic of Kazakhstan for drinking water quality is 54 indicators according to the Sanitary Regulations "Sanitary and epidemiological requirements for water sources, water intake points for household and drinking purposes, domestic and drinking water supply and places of cultural and domestic water use and safety of water bodies", approved by the Order of the Minister of National economy of the Republic of Kazakhstan as of March 16, 2015 № 209.

Negative aspects include insufficient equipment and renewability of laboratory and research equipment at enterprises operating water supply and sanitation systems, inadequate sanitary and epidemiological monitoring of drinking water quality, especially in rural areas.

Data management health surveillance public health Committee of the Ministry of health of RK regarding the quality of drinking water taken from centralized water supply systems (2015):

- 31267 samples of tap water were examined by laboratories of the republican expertise centers for microbiological indicators, of which 614 or 2.0% - do not meet the requirements of sanitary norms (in 2014 - 2.5%).

Above the average republican indicator were the indicators in Atyrau (30.4%), Akmola (19.6%), Aktobe (6.5%), Kostanay (4.4%), Kyzylorda (4.9%), Pavlodar (5 , 6%) and South Kazakhstan (2.8%) regions.

For sanitary and chemical indicators, 28502 water samples were examined, of which 715 or 2.5% were not met (2.8% in 2014).

In the Republic of Kazakhstan, epidemiological surveillance of cholera, acute intestinal infections (AII), including bacterial dysentery, Escherichiacoli, typhoid fever, viral hepatitis A (VHA), with the systematic collection of information about the alleged (primary) cases of the disease from the primary level - PHC (primary health care).

To ensure the "sensitivity of the epidemiological surveillance system," a weekly epidemiological monitoring of the primary incidence is performed, comparing the data of the sanitary background-the results of laboratory studies of samples of water, milk, food, etc.

Information flow is built on the principles of "bottom-up". Individual data on morbidity, laboratory results, risk factors for a given territory, and aggregated data with comparative characteristics for individual territories, socio-age groups, other epidemiological characteristics and results of a study of the activity of the circulation of pathogens are provided.

Data analysis is provided to interested agencies and ministries. In addition, information on the epidemiological situation by morbidity is placed on official websites.

Indicators of infectious diseases of the population of the Republic of Kazakhstan for the period 2014-2015, information on outbreaks of diseases with a water transmission factor for the period 2003 - 2013, information on the quality of drinking water for decentralized water supply facilities, information on drinking water quality of decentralized water supply facilities, indicators of infectious diseases of the population of the Republic of Kazakhstan for the period 2014-2015 and the forecast for 2016-2020, according to the data of the Department of Sanitary and Hygienic Surveillance of the Ministry of Health of the RK, are placed in tables 1. 6 - 1.9.

Table 1.6

Indicators of infectious diseases
of the population of the Republic of Kazakhstan for 2014 - 2015

| Name of infectious diseases | The incidence of infectious diseases per 100 thousand population | |
|-----------------------------|--|-----------|
| | year 2014 | year 2015 |
| Cholera | 0,01 | 0,00 |
| Typhoid fever | 0,00 | 0,01 |
| AII | 77,31 | 75,86 |
| Bacterial dysentery | 4,93 | 6,83 |
| Viral hepatitis A | 4,87 | 2,07 |

For the indicated period, outbreaks of water-related infectious diseases in the Republic of Kazakhstan, however, have not been registered.

Table 1.7

Information on outbreaks of diseases
with a water transmission factor for the period 2003 – 2013

| Year | Morbidity | Number of injured | Including children under 14 years old | Name of regions |
|------|-----------|-------------------|---------------------------------------|---|
| 2003 | VHA | 666 | 73 | Karaganda Oblast, Abay |
| 2004 | AII | 305 | 89 | Aktobe region, Temir district, Kenkiyak settlement |
| 2004 | AII | 85 | 4 | Kokshetau |
| 2010 | AII | 21 | 6 | Akmola region, Shortandinsky district, st. Tonkeris |

| | | | | |
|--------------|-------------------|------|----|--|
| 2011 | VHA | 50 | - | Almaty region, Talgar district, Beskainar village |
| 2012 | АП (О.дизент.) | 14 | - | Atyrau region, Makat district |
| 2013 | АП | 123 | 8 | Almaty region, Enbekshikazakh district, Kainazar village |
| Всего | 7 | 1264 | 50 | |

Table 1.8.

The quality of drinking water for decentralized water supply facilities
for the period 2009-2014

| Specific weight of water samples that do not meet the standards, % | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|--|------------|------------|------------|------------|------------|------------|
| <i>On sanitary and chemical indicators</i> | | | | | | |
| The Republic of Kazakhstan | 6,1 | 5,9 | 5,4 | 4,5 | 5,1 | 7,7 |
| Akmola | 7,5 | 7,8 | 3,8 | 6,2 | 6,4 | 25,8 |
| Aktobe | 5,0 | 4,6 | 5,9 | 3,3 | 3,6 | 18,4 |
| Almaty | - | 0,1 | 2,7 | 1,3 | 5,5 | 0,5 |
| Atyrau | - | - | - | - | - | 0 |
| Zhambyl | 6,0 | 4,2 | 4,3 | 4,8 | 5,7 | 3,3 |
| Karaganda | 4,5 | 4,4 | 7,6 | 4,8 | 8,1 | 5,7 |
| Kostanay | 1,6 | 13,3 | 7,6 | 3,4 | 6,3 | 8,8 |
| Kyzylorda | 29,6 | 16,2 | 23,9 | 33,8 | 49,0 | 19,6 |
| Mangistau | 0,8 | 3,5 | 9,2 | 0,5 | 2,3 | 8,9 |
| Pavlodar | 5,9 | 5,0 | 2,4 | 3,3 | 4,3 | 4,6 |
| <i>By microbiological indicators</i> | | | | | | |
| The Republic of Kazakhstan | 3,8 | 2,9 | 3,5 | 3,3 | 3,1 | 4,9 |
| Akmola | 7,8 | 3,3 | 3,2 | 3,8 | 4,0 | 7,0 |
| Aktobe | 4,0 | 2,5 | 4,8 | 4,6 | 6,4 | 16,8 |
| Almaty | - | 1,2 | 2,5 | 1,0 | 0,9 | 4,4 |
| Atyrau | 2,8 | - | - | - | - | 0 |
| Zhambyl | 1,6 | 1,7 | 0,8 | 0,5 | 0,8 | 1,5 |
| Karaganda | 1,4 | 1,1 | 0,6 | 0,5 | - | 2,6 |
| Kostanay | 4,4 | 5,4 | 7,2 | 4,8 | 5,8 | 6,9 |
| Kyzylorda | 6,2 | 3,5 | - | 0,8 | 4,6 | 5,1 |
| Mangistau | 0,2 | 0,9 | - | - | 1,9 | 0 |
| Pavlodar | 4,9 | 1,5 | 1,3 | 2,1 | 1,1 | 0,8 |

Table 1.9

Quality of drinking water in decentralized water supply facilities
in 2015

| Name of regions | Sanitary and chemical indicators | | | Microbiological indicators | | |
|-----------------------------------|----------------------------------|---|------|----------------------------|---|------|
| | Sample studies | Of these, not corresponding to the standards. | | Sample studies | Of these, not corresponding to the standards. | |
| The Republic of Kazakhstan | 2649 | 173 | 6,5 | 2607 | 104 | 4,0 |
| Akmola | 24 | 6 | 25,0 | 9 | 1 | 11,1 |
| Aktobe | 30 | 2 | 6,7 | 38 | 3 | 7,9 |
| Almaty | 80 | 0 | 0,0 | 101 | 0 | 0,0 |
| Atyrau | 0 | 0 | 0,0 | 0 | 0 | 0,0 |
| EKO | 389 | 16 | 4,1 | 392 | 11 | 2,8 |

| | | | | | | |
|-------------------------|-----|----|------|-----|----|------|
| Zhambyl | 12 | 0 | 0,0 | 12 | 0 | 0,0 |
| WKO | 418 | 46 | 11,0 | 411 | 24 | 5,8 |
| Karaganda | 131 | 10 | 7,6 | 115 | 17 | 14,8 |
| Kostanay | 289 | 16 | 5,5 | 314 | 20 | 6,4 |
| Kyzylorda | 56 | 14 | 25,0 | 57 | 4 | 7,0 |
| Mangistau | 54 | 11 | 20,4 | 42 | 0 | 0,0 |
| Pavlodar | 21 | 4 | 19,0 | 21 | 2 | 9,5 |
| NKO | 583 | 30 | 5,1 | 705 | 9 | 1,3 |
| SKO | 544 | 15 | 2,8 | 382 | 11 | 2,9 |
| Almaty city | 0 | 0 | 0,0 | 0 | 0 | 0,0 |
| Astana city | 0 | 0 | 0,0 | 0 | 0 | 0,0 |
| DCP in transport | 18 | 3 | 16,7 | 8 | 2 | 25,0 |

Table 1.9

Indicators of infectious diseases of the population of the Republic of Kazakhstan for the period 2014-2016. and forecast for 2017-2020

| № | Name of infectious diseases | The incidence of infectious diseases per 100 thousand population | | | | | | |
|----|-----------------------------|--|-------|-------|------|------|------|------|
| | | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| 1. | Cholera | 0,01 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| 2. | Typhoid fever | 0,00 | 0,01 | 0,01 | 0,00 | 0,00 | 0,00 | 0,00 |
| 3. | AII | 77,31 | 75,86 | 69,13 | 63,6 | 55,0 | 46,4 | 37,8 |
| 4. | Bacterial dysentery | 4,93 | 6,83 | 4,12 | 7,2 | 5,9 | 5,1 | 4,4 |
| 5. | Viral hepatitis A | 4,87 | 2,07 | 2,3 | 1,3 | 1,1 | 1,0 | 1,0 |

The Annex to the Report contains regional (by oblast) priority problems in the state of water resources and their use for water supply and sanitation, as well as a summary of the progress in the implementation of programs for the development of water supply and sanitation systems of interest in the context of the target targets for the Protocol on water and health.

All of them also deserve attention and specify the information on the general state of water resources and use for water supply and sanitation, described above, with details by regions (regions).

Conclusions on the analysis of the current state

1. The water legislation of the Republic of Kazakhstan sufficiently fully covers all facilities and entities involved in solving problems affecting the scope of industrial and social responsibility falling within the scope of the Protocol on Water and Health. As a positive trend, it should be noted that the legislation is constantly being improved taking into account the best world practices and taking into account local conditions and opportunities.

The Republic of Kazakhstan is an active participant in international cooperation in improving the principles of water resources management, development and modernization of water supply and sanitation practices in the OECD, EECCA, UNDP, Global Water Partnership, etc. The main results of this cooperation, which are acceptable for the current situation, their practical implementation.

At the same time, it should be noted that there is always an opportunity to improve the legislative and regulatory framework and mechanisms for its implementation, including in the areas of water management (use, regulation, environmental condition), development and modernization of water supply and sanitation, in these important issues of life support. First of all, it concerns the creation of legal norms to ensure the expansion of the population's access to quality (healthy) drinking water.

2. In the field of water resources management, the main tasks are issues of integrated rational use of water resources by economic entities and priority for the population; reduction of losses of water resources at all stages of production and consumption; ensuring environmental safety of water bodies. An analysis of the baseline shows that there is a lot of work to be done in these areas, which motivates the implementation of the State Water Management Program and the Regional Development Program. Practical assistance in their implementation can be provided by the draft targets under the Protocol being developed. One of the important problems in this part is to reduce the level of pollution of water bodies, which are a source for the production of drinking water. This can be done only through:

- control of unconditional compliance with the regulatory requirements for the quality of wastewater treatment entering water bodies from industrial sewerage systems and reducing the volume of their receipt through the introduction of circulating and closed cycles,

- reduction (prevention) of untreated surface (storm, thawed) waters from the territories of industrial enterprises and settlements (cities),

- Increasing the efficiency of sewage treatment plants of water disposal enterprises that service the drainage systems of settlements (cities and rural settlements), including in terms of meeting the conditions for the reception of industrial wastewater.

That is, it should be strictly implemented (by the subjects) and monitored (by all bodies authorized to do so) to comply with the provisions of the existing water legislation. An important aspect in solving the problems in this issue is the wide involvement of the public in their solution. Forms of such participation can be considered under the Protocol.

3. Kazakhstan has adopted and is implementing state programs for the modernization and development of the water supply and sanitation sector aimed at improving the livelihoods of the population and the entire social sphere as a whole. On their basis, regional (regional) programs of specific activities have been developed. The target indicators for the implementation of these program documents have been determined. These indicators characterize a sufficiently high level of development of the water supply and sanitation sector in the country.

At the same time, it becomes necessary to specify (refine) these indicators, based on the specific conditions and financial and economic capabilities of the state and each region separately.

In this regard, the Protocol provides an opportunity, based on the specific capabilities of the regions and targets of the program documents, to identify and monitor their (on the basis of modern requirements) targets for access to drinking water and sanitation services (for urban or rural settlements in certain regions) .

4. The level of the state of water supply and sanitation in rural settlements (technical condition and equipment, management forms, availability of qualified specialists, etc.) and the volume of services rendered to the population, despite the efforts made, still lags far behind the current level of their development in cities. In this regard, it is preferable to use the capabilities of the Protocol, primarily for rural settlements and their inhabitants.

5. Significant improvement in the water and public health problems can not be solved without modernization and development of a laboratory and research base and program-methodological support for water quality control at all stages of its movement from source to specific consumer. This issue also deserves consideration when selecting the Project's targets.

6. The issue of increasing the requirements for the procedure for water quality control in the water distribution network and for the end user is worthy of attention. Consideration should be given to the compatibility of the existing procedure with the best practices of the EU countries and, if appropriate, to develop appropriate targets.

7. Analysis of the baseline shows that in the current state of water supply and sanitation in the country, the most vulnerable segments of the population, such as children, should be provided with quality services. The scope of the Protocol makes it possible to concentrate efforts on this category of residents of the country. In this regard, attention should be focused on the quality of water supply and sanitation services in children's institutions, both in urban and, first of all, in rural settlements. It is about children's institutions (kindergartens, nurseries, health-improving complexes), schools, hospitals, etc.

8. The current situation does not give grounds for asserting that the quality of water in surface water bodies, despite the measures being taken, tends to improve. In this connection, it is necessary to develop, within the framework of the Protocol, a set of indicators that are directed to water objects of the II category (for bathing, resting on the water, amateur rest, etc.).

An analysis of the state of water and health conducted by national experts shows that there are problems that have been examined in greater detail with the participation of a wide range of specialists with different professional orientations, representing various ministries and departments related to this issue, and representatives of the public. This circle of issues was also considered in detail and discussed at two special forums (Almaty, Borovoe) with the involvement of national and international experts.

2. Target indicators for the Protocol on water and health and measures to achieve them in the Republic of Kazakhstan

2.1. Identification and differentiation of problems

In developing the targets for the Protocol on Water and Health, the joint UNECE-WHO-EURO document "Guidelines for setting targets, measuring progress and reporting" was used as a methodological basis.

Based on the analysis of the current situation, consideration and wide discussion of the problems related to water and health of the population, the following targets were developed for the Protocol on Water and Health (Table 2.1).

Table 2.1
Target indicators of the Republic of Kazakhstan to the Protocol on Water and Health for the period 2017 – 2020

| № | Target Areas | Targets |
|-----|--|--|
| I. | "Quality of the supplied drinking water", in accordance with subparagraph (a) of paragraph 2 of Article 6 of the Protocol | 1) Reducing the specific number of drinking water samples that do not comply with the microbiological safety standards 2) Reducing the specific number of drinking water samples that do not meet the sanitary and chemical safety standards 3) Expansion of the potential for safe water supply to human settlements 4) Improving the sanitary and technical condition of water supply facilities and structures |
| II. | "Reducing outbreaks and incidents of water-related diseases", in accordance with article 6, paragraph 2 (b), of the Protocol | Reducing the incidence rate 5) cholera, typhoid fever 6) acute viral hepatitis 7) dysentery 8) AII 9) Reducing the scale of outbreaks and cases of water-related diseases |

| | | |
|-------|--|--|
| III. | "Access to drinking water", "Area of territory or number, or proportions of population groups that should be served by collective systems of drinking water supply or for which it is necessary to improve the supply of drinking water by other means", in accordance with subparagraph (c) of paragraph 2 of Article 6 of the Protocol | 10) Increase of provision of population with centralized water supply 11) Provision of guaranteed quality of drinking water for preschool institutions, schools, medical and preventive institutions 12) Provision of the population of rural settlements with water of guaranteed quality 13) Use of the existing potential of groundwater sources |
| IV. | "Access to sanitation", "Area of territory or number, or proportions of population groups that should be served by collective systems of sanitation or for which it is necessary to improve the system of sanitation by other means" - in accordance with subparagraph 2 (d) Article 6 of the Protocol | 14) Increased access of the population to centralized drainage systems |
| V. | "Levels of efficiency of collective and other water supply systems", "Levels of efficiency to be achieved by such collective systems and, respectively, other such water supplies in accordance with Article 6, paragraph 2 (e), of the Protocol | 15) Improving water consumption accounting, reducing water loss |
| VII. | "The application of recognized good practices in the management of water supply", in accordance with subparagraph (f) of paragraph 2 of Article 6 of the Protocol | 16) Increase the investment attractiveness of the water supply and sanitation sector for the involvement of private capital in its financing. |
| VIII. | "Application of recognized good practices in the management of sanitation" (art. 6, para. 2 (f) (continued)) | 17) Improvement of legal norms in relation to sanitary preventive measures |
| IX. | "Cases of discharge of untreated wastewater (Article 6, paragraph 2 (g) (i))" frequency of discharges: (i) untreated wastewater from wastewater collection systems " | 18) Preventing the diversion of untreated sewage into water bodies from settlements and production facilities |
| X. | "Cases of discharge of untreated storm water streams from collector systems into waters" falling within the scope of the Protocol (Article 6, paragraph 2 (g) (ii)) "frequency of discharges: (ii) untreated storm water flows from sewage collection systems" | 19) Improvement of storm water management systems |
| XI. | "Quality of wastewater discharges from wastewater treatment plants into waters" falling within the scope of this Protocol (art. 6, para. 2 (h)) | 20) decrease in the receipt of pollutants into water bodies 21) improvement of legal norms in the field of wastewater discharges |
| XII. | "The removal or reuse of sewage sludge from collective systems or other sanitary facilities" (art. 6, para. 2 (i), first part)) | 22) improvement of national standards for the utilization of sewage sludge |
| XV. | "Quality of waters used for bathing" (art. 6, para. 2 (j), second part) | 23) achievement of the conformity of the quality of the waters used for bathing with the standards for microbiological indicators 24) achievement of the conformity of the quality of the waters used for bathing with the |

| | | |
|--------|--|---|
| | | standards for sanitary and chemical indicators 25) improving the regulatory requirements for all waters intended for bathing |
| XVI. | "Quality of waters used for aquaculture or the breeding or harvesting of shellfish and shellfish" (art. 6, para. 2 (j), third part) | 26) achievement of the normative-permissible quality of waters used for aquaculture and the breeding or harvesting of mollusks and crustaceans |
| XVII. | "The application of recognized good practice in the management of enclosed waters that are generally available for bathing" (art. 6, para. 2 (k)) | 27) increase of efficiency and reliability of closed water management, generally accessible for swimming (swimming pools, spas) |
| XVIII. | "Identification and remediation of particularly polluted areas" (art. 6, para. 2 (l)) | 28) reduction of the share of the contaminated area near water bodies |
| XX. | "Periodicity of publication of information on the quality of supplied drinking water and other waters relevant to the protocol" (Article 6, paragraph 2 (n)) | 29) raising awareness about the quality of drinking water and the sanitary and epidemiological situation in the Republic of Kazakhstan 30) public participation in achieving the targets |

Thus, out of 20 target areas 16 were selected, for which the achievement of 30 Target indicators is planned.

These targets correspond to the needs and opportunities of the Republic of Kazakhstan in the field of health, environmental protection, social and economic development and are designed taking into account the analysis of local conditions, the main problems related to water and health, as well as available financial opportunities. Target indicators and terms of their achievement are established in accordance with the results of the analysis of approved state programs of the RK on these issues for 2017-2020.

According to the Protocol, in the framework of the use of agreed indicators, many issues related to water, environment and health were comprehensively and comprehensively covered.

The targets were developed for the period from 2017 to 2020. If necessary, they will be adjusted taking into account the relevant requirements and available opportunities.

2.2. Justification of target indicators and terms of their implementation

Area I. Quality of supplied drinking water (Article 6, paragraph 2-a)

Current situation

The parameters of drinking water quality standards in Kazakhstan generally correspond to European standards (hereinafter - EU) and the World Health Organization, but the levels of the maximum allowable values of international standards, for example, for turbidity, are often more stringent.

The sampling of water is usually limited to water treatment facilities. Systematic and regular water sampling for determining its quality in houses or in the water supply network is not carried out.

According to the Committee for the Protection of Public Health of the Ministry of Health of the Republic of Kazakhstan (the authorized body for sanitary and epidemiological well-being), the main causes affecting the quality of water in open reservoirs are: non-observance of the size of water protection zones, generation of spontaneous household dumps, sewage of production and agricultural facilities, production facilities on the banks of riverbeds without coordination with the sanitary and epidemiological services, accidents on sewer networks and others.

Table 2.2

*The quality of drinking water for decentralized water supply facilities
for the period 2009-2014*

| Specific weight of water samples that do not meet the standards, % | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>On sanitary and chemical indicators</i> | | | | | | |
| The Republic of Kazakhstan | 6,1 | 5,9 | 5,4 | 4,5 | 5,1 | 7,7 |
| Akmola | 7,5 | 7,8 | 3,8 | 6,2 | 6,4 | 25,8 |
| Aktobe | 5,0 | 4,6 | 5,9 | 3,3 | 3,6 | 18,4 |
| Almaty | - | 0,1 | 2,7 | 1,3 | 5,5 | 0,5 |
| Atyrau | - | - | - | - | - | 0 |
| Zhambyl | 6,0 | 4,2 | 4,3 | 4,8 | 5,7 | 3,3 |
| Karaganda | 4,5 | 4,4 | 7,6 | 4,8 | 8,1 | 5,7 |
| Kostanay | 1,6 | 13,3 | 7,6 | 3,4 | 6,3 | 8,8 |
| Kyzylorda | 29,6 | 16,2 | 23,9 | 33,8 | 49,0 | 19,6 |

| | | | | | | |
|--------------------------------------|------------|------------|------------|------------|------------|------------|
| Mangistau | 0,8 | 3,5 | 9,2 | 0,5 | 2,3 | 8,9 |
| Pavlodar | 5,9 | 5,0 | 2,4 | 3,3 | 4,3 | 4,6 |
| <i>By microbiological indicators</i> | | | | | | |
| The Republic of Kazakhstan | 3,8 | 2,9 | 3,5 | 3,3 | 3,1 | 4,9 |
| Akmola | 7,8 | 3,3 | 3,2 | 3,8 | 4,0 | 7,0 |
| Aktobe | 4,0 | 2,5 | 4,8 | 4,6 | 6,4 | 16,8 |
| Almaty | - | 1,2 | 2,5 | 1,0 | 0,9 | 4,4 |
| Atyrau | 2,8 | - | - | - | - | 0 |
| Zhambyl | 1,6 | 1,7 | 0,8 | 0,5 | 0,8 | 1,5 |
| Karaganda | 1,4 | 1,1 | 0,6 | 0,5 | - | 2,6 |
| Kostanay | 4,4 | 5,4 | 7,2 | 4,8 | 5,8 | 6,9 |
| Kyzylorda | 6,2 | 3,5 | - | 0,8 | 4,6 | 5,1 |
| Mangistau | 0,2 | 0,9 | - | - | 1,9 | 0 |
| Pavlodar | 4,9 | 1,5 | 1,3 | 2,1 | 1,1 | 0,8 |

The general unsatisfactory state of water supply systems (more than 60% worn) worsens the quality of centralized water supply services. The efficiency of public services in Kazakhstan lags behind those of the United Kingdom, Italy, and Russia: there are 1.5 to 4 employees per thousand water users, while in other countries it is 0.3 to 1.3 people .

In general, with the increase in the population, the gradual economic recovery of the demand for water will increase. In this connection, it becomes necessary to carry out large-scale works on the economy and rational use of water resources.

In providing the population of the republic with quality drinking water, a significant improvement in the state of water supply and sanitation services, especially in rural areas, there are the following key barriers:

- The state policy on ownership of strategically important water supply and sanitation facilities is not sufficiently defined;
- Not all localities have established specialized organizations for servicing water supply facilities and networks;
- In addition to large cities on water pipelines, production laboratories are not organized, which regularly monitor the quality and safety of drinking water.
- The majority of centralized water and wastewater systems in urban and rural areas are worn down by 40-60%.
- The unified regulatory and legal framework in the field of regulation of water supply and sanitation has not been improved.
- The groundwater potential is insufficient to provide the population with drinking water.
- The quality of designing water supply and sanitation systems in the republic is not at the proper level.

- Unified automated monitoring systems for the state of the water supply and wastewater sector, monitoring of the quality of underground and surface waters have not been created.

Table 2.3.

Indicators and activities for the Focus Area I

| № | Index | Indicators | Events | Responsibles | Date |
|---|---|---|--|--|------------|
| 1 | Reducing the specific number of drinking water samples that do not comply with the microbiological safety standards | 1) the proportion of drinking water samples that do not meet the requirements for microbiological safety indicators from centralized water supply: - in urban areas - no more than 4,0%; - in rural areas - no more than 5.0%. 2) the proportion of drinking water samples that do not meet the requirements for microbiological safety indicators from decentralized water supply (individual wells, wells) - no more than 5% | Sanitary and epidemiological monitoring and sanitary and technical measures; Conducting departmental monitoring of the quality of drinking water and sanitation measures (according to the work programs of enterprises). | Committee for the Protection of Public Health (CPPH) of the Ministry of health of the Republic of Kazakhstan The Committee for Construction and Housing and Communal Services (CCH and CS) of the Ministry of investment and development of the Republic of Kazakhstan, organizations and departments of the LEB (local executive bodies) | Until 2020 |
| 2 | Reducing the specific number of drinking water samples that do not meet the sanitary and chemical safety standards | 3) the proportion of water samples that do not meet the standards for sanitary and chemical indicators from centralized water supply - in urban areas - no more than 5.0%; - in rural areas - no more than 6.0%. 4) the proportion of water samples that do not meet the standards for sanitary and chemical indicators from decentralized water supply (individual wells, wells) - no more than 8.0% | Sanitary and epidemiological monitoring and sanitary and technical measures Conducting departmental monitoring of the quality of drinking water and sanitation measures (according to the work programs of enterprises). | Committee for the Protection of Public Health (CPPH) of the Ministry of health of the Republic of Kazakhstan The Committee for Construction and Housing and Communal Services (CCH and CS) of the Ministry of investment and development of the Republic of Kazakhstan, organizations and departments of the LEB | Until 2020 |

| | | | | | |
|---|---|--|---|---|--|
| | | | | (local executive bodies) | |
| 3 | Expansion of the potential for safe water supply to human settlements | 5) provision of departmental laboratory monitoring of drinking water quality indicators in 2017-2020: 6) coverage of production and technical maintenance of water pipelines in 2017-2020: | Sanitary and epidemiological monitoring of infectious diseases Organization of production control by water service companies Organization of transfer of ownerless water pipelines to the balance | Bodies and organizations of the CPPH MH of the RK CCH and CS MID Local executive bodies | 2017 – 70% 2018 – 80% 2019 – 90% 2020 – 100% 2017 – 70% 2018 – 80% 2019 – 90% 2020 – 100% Until 2020 |
| 4 | Improvement of the sanitary and technical condition of water supply facilities and structures | 7) decrease in the proportion of centralized water supply facilities that do not meet the requirements of sanitary regulations (JV): • Urban and rural settlements - no more than 11%; 8) Decrease in the proportion of decentralized water supply facilities in rural settlements that do not meet the requirements of the JV - no more than 11%; | Conducting an annual technical assessment of the sanitary and technical condition of water pipes | CCH and CS MID, IIO, ViC Company | (central / decentralized). 2017 – 14% 2018 – 13% 2019 – 12% 2020 – 11% |

Area II. Reducing outbreaks and incidents of water-related diseases (art. 6, para. 2 (b))

Current situation

Epidemiological surveillance of cholera, acute intestinal infections, including bacterial dysentery, Escherichiacoli, typhoid fever, viral hepatitis A, is carried out in the Republic of Kazakhstan, with the systematic collection of information from the primary (primary) cases of primary care (PHC) primary care.

The indicators of infectious diseases of the population of the Republic of Kazakhstan for 2014-2015 according to the department of sanitary and hygienic surveillance of the committee for the protection of consumer rights of the Ministry of Energy of the RK are shown in Table 2.4.

Table 2.4

Indicators of infectious diseases of the population of the Republic of Kazakhstan for 2014-2015

| № | Name of infectious diseases | The incidence of infectious diseases per 100 thousand population | |
|---|-----------------------------|--|---------|
| | | 2014год | 2015год |
| 1 | Cholera | 0,01 | 0,00 |
| 2 | Typhoid fever | 0,00 | 0,01 |
| 3 | АИ | 77,31 | 75,86 |
| 4 | Bacterial dysentery | 4,93 | 6,83 |
| 5 | Viral hepatitis A | 4,87 | 2,07 |

For 2014-2015 in the Republic of Kazakhstan outbreaks of infectious diseases associated with water, however, are not registered. To solve the problems, the following Indicators and measures for the target area II (Table 2.5).

Table 2.5.

Indicators and activities for the target area II

| № | Index | Indicators | Events | Responsibles | Date |
|---|---|--|---|---|--|
| 5 | Reduction in the incidence of cholera, typhoid fever | 9) zero level of incidence of cholera and typhoid; | Epidemiological monitoring of morbidity | Bodies and organizations of the CPPH MH of the RK | until 2020 |
| 6 | Reduction in the incidence of acute viral hepatitis A | 10) incidence of acute viral hepatitis A, not more than: - 1.3 per 100 thousand of population - 1.1 per 100 thousand of population - 1.0 per 100 thousand of population - 1.0 per 100 thousand of population | Epidemiological monitoring of morbidity | Bodies and organizations of the CPPH MH of the RK | until 2020 - 2017 - 2018 - 2019 - 2020 |
| 7 | Reducing the incidence of dysentery | 11) - the incidence of dysentery, not more: - 7.2 per 100 thousand of population - 5.9 per 100 thousand of population - 5.1 per 100 thousand of population - 4.4 per 100 thousand of population | Epidemiological monitoring of morbidity | Bodies and organizations of the CPPH MH of the RK | until 2020 - 2017 - 2018 - 2019 - 2020 |
| 8 | Reducing the incidence of acute intestinal infections (enterohemorrhagic E. coli (EGCA)); | 12) - the incidence of acute intestinal infections, no more: - 63.6 per 100 thousand of population | Epidemiological monitoring of morbidity | Bodies and organizations of the CPPH MH | until 2020 - 2017 - 2018 |

| | | | | | |
|---|---|---|---|---|------------------|
| | | - 55.0 per 100 thousand of population - 46.4 per 100 thousand of population - 37.8 per 100 thousand of population | | of the RK | - 2019 - 2020 |
| 9 | Reducing the scale of outbreaks and incidents of water-related diseases | 13) zero level of group morbidity: a) cholera; b) bacillary dysentery (shigellosis); c) AII (enterohemorrhagic E. coli (EGCA)); d) viral hepatitis A; e) typhoid fever | Epidemiological monitoring of morbidity | Bodies and organizations of the CPPH MH of the RK | - 2020 |

Area III. Access to drinking water (Article 6, paragraph 2 c)

Area "The area of the territory or the number or proportions of population groups that should be served by collective systems of drinking water supply or for which it is necessary to improve the supply of drinking water by other means"

Current situation

At present, 67% of the population of Kazakhstan can use the central system of drinking water supply, while in Russia this figure is 89%, in the UK, Germany, France, Singapore and Israel - almost 100%. Access to the centralized system of water disposal is less than half the population of the country, in Germany and France - 93%, the UK - 98%. By 2040 it is expected to increase the irretrievable consumption of water for communal and domestic needs to 1.4 km³ (an average of 1.9% per year).

In the medium term, the population of Kazakhstan is projected to grow to 20.8 million people, which will lead to an increase in water consumption by 35%, while the urban population will increase from the current 53% to 73% due to the formation of agglomeration centers based on the largest cities Kazakhstan - Astana, Almaty and Shymkent with a population of at least two million people, as well as Aktobe and Aktau, which have a high proportion of the able-bodied population and where small and medium-sized businesses are most actively developing. As the country develops, other major cities of Kazakhstan may become centers of agglomeration, which will require the construction of a new water infrastructure to meet the needs of the growing population of agglomerations in water supply and sanitation systems.

The situation with a shortage of available drinking water, wastewater and wastewater treatment is compounded by a backlog in the technical support and repair of the existing centralized water supply infrastructure. A significant part of the communal infrastructure is in a dilapidated state, which leads to high water losses. At the national scale, they make up about 40% of the total, which is significantly higher than in countries such as the US - 11%, Russia - 21%, the UK - 23%. One of the reasons for the backlog in infrastructure development is an inefficient tariff-setting mechanism, which does not allow to cover operational and investment costs.

Some southern territories of the country (Kyzylorda, Zhambyl, South-Kazakhstan regions) lack the generally recognized sources for the organization of domestic and drinking water supply. In this connection, water from irrigation irrigation canals is used to supply water to small settlements (usually rural ones). The water quality of such water bodies does not meet the established sanitary and hygienic standards for sources of

domestic and drinking water supply. The task is to gradually reduce the use of water from irrigation irrigation ditches for domestic and drinking water supply.

To solve the problems, the following indicators and measures for the target Area III (table 2.6).

Table 2.6.

Indicators and activities for the target area III "Access to drinking water" (Article 6, paragraph 2c)

| № | Index | Indicators | Events | Responsibles | Date |
|----|--|---|--|---|--|
| 10 | Increase in the provision of population with centralized water supply | 14) access to centralized water supply: - in rural areas of the total number of rural settlements: - 55.0% in 2017; - 58,0% - in 2018; - 62.0% in 2019; - in cities: - 90.0% - in 2017; - 93.0% in 2018; - 97.0% in 2019; | Annual technical assessment, Development of an information and analytical database Construction of new water supply networks. Explanatory work among the population on the health risks of decentralized sources of drinking water and the benefits of connecting to a centralized one. Increasing the efficiency of tariff formation for drinking water for the population | Ministry of Investment and Development of the RK, Committee for Construction and Housing Local executive bodies | Until 2020, according to the state program |
| 11 | Provision of guaranteed quality drinking water, preschool children's organizations, schools, medical and preventive institutions | 15) the level of provision with centralized water supply: children's preschool organizations - 100% in urban settlements; - children's health-improving organizations with round-the-clock stay of children in the health-improving season - 100%; general education organizations, including boarding schools - 100%; - Treatment and prophylactic institutions | Annual situation analysis | CCH and CS MID, IIO | Until 2020 |

| | | | | | |
|----|---|---|---|--|------------|
| | | with a hospital - 100% 16) the level of provision of guaranteed quality drinking water: preschool children's organizations - 100% in rural settlements; - children's health-improving organizations with round-the-clock stay of children in the health-improving season - 100%; general education organizations, including boarding schools - 100%; - Treatment and prophylactic institutions with a hospital - 100% | | | |
| 12 | Provision of the population of rural settlements with water of guaranteed quality | 17) Decrease in the availability of water from irrigation ditches for the population of rural settlements - from 1.5% in 2017. up to 0% in 2020. | Annual situation analysis | ПО, ССН and CS МІД, КВР МСХ РК | Until 2020 |
| 13 | Use of the existing potential of groundwater sources | 18) Carrying out exploration work to ensure the supply of underground water in rural areas, including: in 2017 - 480; in 2018 - 480; in 2019 - 419; 19) additional exploration of groundwater deposits for the purpose of reassessing reserves for cities and large settlements, including: in 2017 - 35; in 2018 - 5 | Annual situation analysis Development and implementation of projects | КДС и ЖКХ МИР РК, Комитет Г и Н МИР РК, КВР МСХ РК | Until 2020 |

Area IV. Access to sanitation (Article 6, paragraph 2 (d))

Current situation

Access to the centralized sewage system in cities and towns has 5373,50 million people or 65,7% of the urban population of the country and 8,9% of the rural population.

The condition of sewerage networks and most treatment facilities is unsatisfactory. There are no sewage systems in 9 cities. Of the existing 58 sewage treatment plants, 10 are in unsatisfactory technical condition. In 13 receivers, there are no treatment facilities at all, respectively, discharge of sewage is carried out without preliminary cleaning. Only in 41 cities there are sewage treatment plants (STP) with a full technological

cycle, of which in 10 cities the wear of STP is more than 70%. In the remaining 17 cities there is only mechanical cleaning. Unrefined sewage is discharged to filtration fields (Taraz city) or to storage tanks (Kokshetau, Kyzylorda, Uralsk, Petropavlovsk, Kostanay). In the years. Taldykorgan, Atyrau, Pavlodar, Ust-Kamenogorsk and Semipalatinsk, existing treatment facilities experience overloads of 1.5-2 times, 34% of sewage treatment plants reached 70% of physical wear. A number of wastewater treatment facilities work with overload, which leads to a mismatch of wastewater treatment technology.

The main key barriers in providing the population with good quality domestic and potable water in the Republic of Kazakhstan are:

- Provision of rural population with centralized water supply systems is currently inadequate.
- In many settlements on the sources of domestic and drinking water supply there are no organized zones of sanitary protection.
- The majority of water intake facilities and water supply networks do not meet the requirements of sanitary standards, they are technically worn out. Many dead-end water networks, where stagnation and bacteriological contamination of water occurs.
- Most of the existing water-separating columns in the settlements are in non-operating condition, the inspection wells are flooded. Due to the hourly water supply to most of the settlements of the republic (2-3 hours a day), the water supply network is not under constant pressure, so contaminated water is drained from the wells back into the network, which leads to the registration of infectious diseases among the population, and sometimes water flare.
- In addition to large cities, water treatment and water purification are not carried out in the country, there are no local cleaning systems, before filing in the water distribution network.
- Disinfection chlorination units are insufficiently installed in rural water intake facilities and water pipes, and disinfection facilities are not sufficient.
- Local authorities responsible for water supply to the population, poorly provide the existing water supply facilities and networks with professional personnel, security, etc.
- Due to the lack of protection in rural waterworks, there are access to sanitary protection zones for unauthorized persons and animals.
- In rural settlements and some cities of regional subordination the organizations operating water supply systems do not have departmental laboratories for systematic and planned monitoring of drinking water quality.
- Across the country, sanitary and laboratory monitoring of drinking water is carried out on a planned basis from the sanitary-epidemiological service established by control points and by epidemiological significance of the controlled objects.
- Provision of rural population and suburban settlements with centralized water disposal systems is currently low.
- Most of the objects after commissioning continue to be abandoned and not operated;

Information on the state of security of settlements of the Republic of Kazakhstan by central sewerage networks for 2015 is given in Table 2.7.

Table 2.7.

State of provision of settlements of the Republic of Kazakhstan with central sewerage networks for 2015

| № | Territory Names | Share of cities provided by central sewerage networks (%) | Share of rural settlements provided by central sewerage networks (%) |
|---|-----------------|---|--|
|---|-----------------|---|--|

| | | | |
|----|---------------------|-------------|------------|
| 1 | Akmola | 90,0 | 1,9 |
| 2 | Aktobe | 96,0 | 24,7 |
| 3 | Almaty | 33,1 | 6,4 |
| 4 | Atyrau | 40,0 | 7,3 |
| 5 | East Kazakhstan | 68-80,0 | 25-35,0 |
| 6 | Zhambyl | 73,2 | 0 |
| 7 | West Kazakhstan | 65,0 | 0 |
| 8 | Karaganda | 55,3 | 8,0 |
| 9 | Kostanay | 100,0 | 3,5 |
| 10 | Kyzylorda | 32,0 | 0 |
| 11 | Mangistau | 100,0 | 43,3 |
| 12 | Pavlodar | 90,7 | 9,5 |
| 13 | North-Kazakhstan | 100,0 | 0 |
| 14 | South Kazakhstan | 19,4 | 2,1 |
| 15 | Almaty city | 86,4 | 0 |
| 16 | Astana | 90,0 | 0 |
| | Total for RK | 65,7 | 8,9 |

To solve the problems, the following Indicators and measures for the target area IV have been developed (Table 2.8).

Table 2.8.

Indicators and activities for the target area IV

| № | Index | Indicators | Events | Responsibles | Date |
|----|---|---|---|---------------------------|------------|
| 14 | Increase of population access to centralized water disposal systems | 19) access to centralized water disposal systems: - in rural areas from the total number of rural settlements provided with centralized water supply: - 11.5% - in 2017; - 12.0% in 2018; - 13.0% in 2019; - 14.0% in 2020 - in cities: - 88.0% in 2017; - 93.0% in 2018; | Annual situation analysis Construction of centralized and local water drainage systems | CCH and CS MID, IIO | Until 2020 |

| | | | | | |
|--|--|--|--|--|--|
| | | - 97.0% in 2019 - 100% - in 2020 20) Provision of local wastewater treatment systems for DDO, health facilities, schools, in the absence of water disposal systems | | | |
|--|--|--|--|--|--|

Area V. Levels of efficiency of collective and other water supply systems (Article 6, paragraph 2 (e))

Current situation

Losses in the transportation of water are on average: about 60% for agricultural consumers; about 40% for industrial consumers and 50% for municipal utilities from volumes of water consumption. While maintaining the current situation of water use in communal and agricultural sectors, a moderate increase in industrial efficiency until 2040, water withdrawal is expected to increase to 29.7 km³ per year and consumption (taking into account losses) to 24.6 km³ per year.

Losses of water during transportation in Kazakhstan and regions, as well as water fences for recycling and reuse are shown in tables 2.9 to 2.11.

Table 2.9

Loss of water during transportation in Kazakhstan, million m³

| Years | 2010 | 2011 | 2012 | 2013 | 2014 |
|------------------------------|------|------|------|------|------|
| Losses during transportation | 2639 | 3198 | 2932 | 2850 | 2855 |

Table 2.10

Loss of water during transportation in the context of regions, million m³

| Years | 2010 | 2011 | 2012 | 2013 | 2014 |
|----------------------------|------|------|------|------|------|
| The Republic of Kazakhstan | 2639 | 3198 | 2932 | 2850 | 2855 |
| Akmola | 19 | 14 | 8 | 6 | 7 |
| Aktobe | 7 | 10 | 11 | 4 | 8 |
| Almaty | 660 | 682 | 696 | 697 | 757 |
| Atyrau | 39 | 39 | 38 | 24 | 41 |

| | | | | | |
|------------------|------|------|------|------|------|
| East Kazakhstan | 66 | 23 | 64 | 3 | 40 |
| Zhambyl | 670 | 597 | 345 | 693 | 506 |
| West Kazakhstan | 16 | 18 | 18 | 23 | 23 |
| Karaganda | 10 | 11 | 10 | 9 | 9 |
| Kostanay | 546 | 1275 | 1309 | 1100 | 1038 |
| Kyzylorda | 2 | 113 | 4 | 3 | 3 |
| Mangistau | 486 | 292 | 296 | 162 | 291 |
| Pavlodar | 11 | 10 | 7 | 13 | 13 |
| North-Kazakhstan | 5,8 | 5 | 5 | 4 | 4 |
| South Kazakhstan | 56,5 | 66 | 71 | 77 | 75 |
| Almaty city | 7 | 10 | 11 | 8 | 16 |
| Astana | 38 | 33 | 38 | 24 | 24 |

Table 2.11

Reuse and recycling of fresh water, million m3

| Years | 2010 | 2011 | 2012 | 2013 | 2014 |
|-----------------------|--------|--------|--------|--------|--------|
| Turnover water supply | 7126,3 | 6844,3 | 7556,5 | 7665,3 | 7691,2 |
| Repeated water supply | 902,02 | 813,3 | 751,9 | 689,5 | 723,5 |

To solve the problems, the following Indicators and measures for the target area V have been developed (Table 2.12).

Table 2.12.

Indicators and activities for the target area B

| № | Index | Indicators | Events | Responsibles | Date |
|----|---|--|--|---------------------|------------|
| 15 | Improving water consumption accounting, reducing water loss | 21) the coverage of water users in the systems of centralized household and drinking water supply with meters: in cities - 100% and rural settlements - 80% | Annual situation analysis Development of an electronic system for the registration of water users | CCH and CS MID, IIO | Until 2020 |

Area VII. The application of recognized good practice in the management of water supply (Article 6, paragraph 2 (f))

Current situation

In May 2015, an Agreement was signed between the Government of the Republic of Kazakhstan and OECD on the project "Economic aspects of water resources management in EECCA countries: support for the implementation of a program for water resources management". The cost of the project is 100 000 euros.

During the reporting period, the OECD conducted an economic assessment of selected facilities for a multi-purpose water infrastructure, an overview of existing instruments and mechanisms for state support for agriculture, rural development and a single water-intensive processing industry affecting water management.

The issues of economical and rational use of available water resources are priority directions of the water management complex of any country.

The incentive for the economical use of water by communal and industrial enterprises is the introduction of differentiated tariffs. In world practice, the most common is the use of three-level differentiation.

In Kazakhstan, the introduction of differentiated tariffs for volumes of consumption provides for two- and three-level systems. Such a policy of tariff formation ensures water resources saving, and it is beneficial for water users themselves, whose costs can be significantly reduced. According to the Agency of the Republic of Kazakhstan on regulation of natural monopolies, water saving as a result of introduction of differentiated tariffs will make 10%. The introduction of differentiated tariffs in Kazakhstan was completed by 2013.

The economical use of water resources by industrial enterprises should be based on the introduction of innovative technologies, in which less water is used to produce a unit of production, ideally a closed cycle of industrial production.

New approaches to the implementation of the "AK BULAK" Program for 2011-2020 and "REGIONAL DEVELOPMENTS up to 2020" were defined: the direction towards the final result, rather than the process (construction of new facilities, ie annual "development" of allocated funds) . The maximum implementation of projects in water supply in the form of public-private partnerships (trust management, partial shareholding, concession, etc.). The system approach for the construction of new water supply facilities is the work in strict accordance with the Unified list of projects.

To solve the problems, the following Indicators and activities for the target area VII have been developed (Table 2.13).

Table 2.13.

Indicators and activities for the target area VII

| № | Index | Indicators | Events | Responsibles | Date |
|----|---|--|--|-------------------|---------------|
| 16 | Increase the investment attractiveness of the water supply and sanitation sector to involve private capital in its financing. | 22) an increase in the number of operational enterprises for water supply and sanitation with the participation of private capital, including through concession agreements and other contracts. 23) Creation of information and analytical base for monitoring of water supply and sanitation systems in human settlements | Conducting organizational and technical measures for the introduction of PPP forms in the practice of managing enterprises in the water supply and sanitation sector (with vodocanals) | CCH and CS MID | Until 2020 |

Area VIII. The application of recognized good practices in the management of sanitation (Article 6, paragraph 2 (f) (continued))

Current situation

For domestic and household needs, 0.8 to 0.9 km³ of water are consumed annually, or 4 to 7%, of which consumption in cities is 55%, in rural settlements - 11%, and feed losses - about one third of all water intake.

At the same time, there is a tendency to decrease the specific water consumption per inhabitant, which is due to the introduction of apartment counters for water accounting and rise in price of payment for services. However, in this field of activity there are large losses of water (up to 20 - 30%) due to high wear of water supply equipment, the use of outdated technologies, imperfections of sanitary devices in homes, etc.

To solve the problems, the following Indicators and Measures for the Target Area VIII were developed (Table 2.14).

Table 2.14

Indicators and activities for the target area VIII

| № | Index | Indicators | Events | Responsibles | Date |
|----|-------------------------------|---|----------------------------|--------------|-------|
| 17 | Improvement of legal norms in | 24) development, approval and approval of | Development of projects of | CCH and CS | Until |

| | | | | | |
|--|--|--|--------|----------|------|
| | relation to sanitary preventive measures | updated standards for the discharge of industrial wastewater into communal drainage systems of settlements | NLA RK | MID, IIO | 2020 |
|--|--|--|--------|----------|------|

Area IX. Cases of release of untreated wastewater (Article 6, paragraph 2 (g) (i))

Текущая ситуация

In Kazakhstan, much attention is paid to environmental problems, including sewage treatment and the prevention of discharges of untreated wastewater. The legislation (Ecological Code of the Republic of Kazakhstan, Water Code of the Republic of Kazakhstan) provides for provisions that prohibit discharge of untreated sewage into water bodies ("zero discharge"). Nevertheless, in the country there are still separate cases of unauthorized discharges of sewage, including untreated. The problem requires its solution.

For the solution of the problems, the following Indicators and measures of the purview area IX have been developed (Table 2.15).

Table 2.15.

Индикаторы и мероприятия по целевой области IX

| № | Index | Indicators | Events | Responsibles | Date |
|----|--|--|---|--|------------|
| 18 | Prevention of the diversion of untreated sewage into water bodies from settlements and production facilities | 25) maintenance of a zero level for the discharge of untreated sewage into water bodies; | Annual analysis of the implementation of program activities for the reconstruction and modernization of water disposal systems (treatment facilities) | The Committee for Environmental Regulation and Control of the Ministry of Education and Science of the Republic of Kazakhstan, CCH and CS MID, IIO | Until 2020 |

Area X. Cases of discharge of untreated storm water from collector systems into waters subject to the Protocol (Article 6, paragraph 2 (g))

(ii)

Current situation

The situation with discharges of untreated storm sewage from collector systems into the waters falling under the Protocol on the problem of water and health in Kazakhstan remains extremely complicated. In essence, this problem has not received due attention from the relevant state structures to date. The situation is especially difficult in such large cities of Kazakhstan as Almaty and Astana, where there are recent significant storm discharges.

To solve the problems, the following Indicators and measures for the target area X have been developed (Table 2.16).

Table 2.16.

Indicators and activities for the target area X

| No | Index | Indicators | Events | Responsibles | Date |
|----|--|---|--|------------------------|------------|
| 19 | Improvement of the storm water management system | 26) Provision of rainwater drainage systems for large cities of national importance | Annual analysis of the implementation of program activities for the reconstruction and modernization of water disposal systems | CCH and CS MID, IIO | Until 2020 |

Area XI. Quality of wastewater discharges from wastewater treatment plants to waters subject to the Protocol (Article 6, paragraph 2 (h))

Current situation

In 39 cities and large SNPs there are no treatment facilities at all, accordingly, the discharge of sewage is carried out without purification.

Of the total volume of wastewater being treated, up to regulatory requirements only 64.0% is reported, the remaining 36.0% of untreated effluents are discharged to so-called filtration fields, as in the city of Taraz, to storage tanks in the cities of Kokshetau, Uralsk, Petropavlovsk, Kostanay.

Many existing treatment plants have already developed their operational resources and require repair, others - they work with overload, which leads to a discrepancy in wastewater treatment technology design data. So, in the cities of such regions as - Kzylorda, Mangistau, North-Kazakhstan, East Kazakhstan, the percentage of water not purified to standard requirements ranges from 39 to 72%. This indicates that existing treatment facilities are not working efficiently.

The accumulators of treated wastewater are often filled to the maximum levels, there is a constant threat to water bodies and settlements, an emergency breakthrough of the enclosing dams. The consequence of the deterioration of the fixed assets of the drainage networks is a high level of accidents.

A significant amount of waste water from industrial enterprises comes directly to urban wastewater treatment plants, which are not designed for industrial wastewater treatment. Recently, concentrations of detergents have increased in household wastewater, which are difficult to clean and have a long period of conservation of harmful effects on the natural environment and, accordingly, pollute water sources.

According to environmental authorities, 50% of sewage discharged by large industrial enterprises do not meet the requirements, the concentration of harmful substances in wastewater discharged into the drainage systems of settlements exceeds the maximum permissible standards. In general, depreciation of fixed assets of sewerage systems in most settlements of the republic is 40-70%, and in some it reaches 100%.

To solve the problems, the following Indicators and measures of the field XI have been developed (Table 2.17).

Table 2.17

Indicators and activities for the target area XI

| № | Index | Indicators | Events | Responsibles | Date |
|----|---|--|--|--|------------|
| 20 | Decrease in receipt of pollutants into reservoirs | 27) Decrease in receipt of pollutants into water bodies (% by 2017): -heavy metals - 25%; -stable organic pollutants - 25%; nitrogen -10%; - phosphorus - 10% 28) reduction of the level of organic pollution; 29) reduction of the level of chemical pollution and hazardous chemicals; 30) decrease in the level of microbiological indicators; | Annual monitoring of the ecological status of water bodies and compliance with existing environmental legislation by water consumers; Permanent production control on the OS enterprises, discharging sewage into water bodies. Reconstruction and modernization of the OS Introduction of recycled water supply. | The Committee for Environmental Regulation and Control of the Ministry of Education and Science of the Republic of Kazakhstan, IIO, Branch ministries on the subordination of water users | Until 2020 |
| 21 | Improvement of legal norms in the | 31) improvement of the system for permits to | Development and | CERC ME RK , | Until |

| | | | | | |
|--|--------------------------------|--|---|------|------|
| | field of wastewater discharges | discharge industrial waste water; 32) development, harmonization and approval of quality standards for both urban and industrial wastewater after treatment | introduction of changes in the NLA, which regulate the responsibility for poor-quality wastewater treatment | IIO, | 2020 |
|--|--------------------------------|--|---|------|------|

Area XII. The disposal or reuse of sewage sludge from collective systems or other sanitary facilities (art. 6, para. 2 (i), first part)

Current situation

The problem has not been sufficiently studied in Kazakhstan and as a consequence is not reflected in the legislation. It is necessary to give more attention to the issue.

To solve the problems, the following Indicators and measures for the target area XII were developed (Table 2.18).

Table 2.18

Indicators and activities for the target area XII

| № | Index | Indicators | Events | Responsibles | Date |
|----|--|--|---|---------------------------------|------------|
| 22 | Improvement of national standards for the utilization of sewage sludge | 33) legislative provisions ensuring, re-use of precipitation that do not pose a threat to human health | Development of NLP, Study of international experience in the utilization of sewage sludge | CERC ME RK, IIO, CC and HCS MID | Until 2020 |

Area XV. The quality of the waters used for bathing (art. 6, para. 2 (j), second part)

Current situation

One of the important problems related to water and health of the population is bathing water. In Kazakhstan, work is under way in this direction. At the same time, the problem requires much attention. First of all, it is necessary to organize monitoring of the waters used for bathing and for this purpose it is necessary to develop the relevant regulatory legal acts (NAPs) that regulate work in this part.

To solve the problems, the following Indicators and measures for the target area XV have been developed (Table 2.19).

Table 2.19

Indicators and activities for the target area XV

| № | Index | Indicators | Events | Responsibles | Date |
|----|-------------------------------------|--|------------------------------|--------------|-------|
| 23 | Achievement of the quality of water | 34) Conformity of water quality of surface | Monitoring of water quality, | CPPH MH RK, | Until |

| | | | | | |
|----|---|---|------------------------------|------------------------------------|---------------|
| | used for bathing, standards for microbiological indicators | water bodies used for bathing to the requirements of sanitary standards for microbiological indicators | | IIO, CERC ME RK, | 2020 |
| 24 | Achievement of the conformity of the quality of the waters used for bathing with the standards for sanitary and chemical indicators | 35) Conformity of water quality of surface water bodies used for bathing to the requirements of sanitary standards for sanitary and chemical indicators | Monitoring of water quality, | CPPH MH RK, IIO, CERC ME RK, | Until 2020 |
| 25 | Improvement of regulatory requirements for all waters intended for bathing | 36) Sanitary and epidemiological requirements for the maintenance of a reservoir intended for bathing; | Elaboration of NLP | CPPH MH RK, | Until 2018 |

Area XVI. Quality of waters used for aquaculture or the breeding or harvesting of molluscs and shellfish (art. 6, para. 2 (j), third part)

Current situation

The use of water bodies for aquaculture, breeding or gathering mollusks in Kazakhstan began to be paid relatively recently. Now in the country the corresponding partnerships and artels are organized. However, many issues, in particular, concerning legislative support and regulation of these activities, have not been sufficiently developed. It is necessary to conduct specialized scientific and applied research in this area, as well as work with the goal of developing recommendations for improving legislation in this area.

To solve the problems, the following Indicators and measures of the XVI's field of vision have been developed (Table 2.20).

Table 2.20

Indicators and activities for the target area XVI

| № | Index | Indicators | Events | Responsibles | Date |
|----|--|--|--|--------------------|---------------|
| 26 | Achieving the normative-permissible quality of waters used for aquaculture and the breeding or harvesting of shellfish and shellfish | 37) Reduction of the proportion of non-compliance in the total volume of water samples, in water bodies used for aquaculture or the breeding or harvesting of shellfish and shellfish by physico-chemical and biological indicators. | Environmental monitoring of water quality, | IIO, CERC ME RK | Until 2020 |

Area XVII. The application of recognized good practice in the management of enclosed waters that are generally available for bathing (art. 6, para. 2 (k))

Current situation

Kazakhstan has accumulated quite a lot of experience in the management of closed waters, which are generally available for bathing. At the same time, it is necessary to carry out a number of measures to increase the efficiency and reliability of the management of these waters.

To solve the problems, the following Indicators and measures for the target area XVII have been developed (Table 2.21).

Table 2.21

Indicators and activities for the target area XVII

| № | Index | Indicators | Events | Responsibles | Date |
|----|--|--|---|--------------------|---------------|
| 27 | Increase of efficiency and reliability of closed water management, generally available for swimming (swimming pools, spas) | 38) Provision of water quality in confined waters, generally accessible for swimming (pools) by: microbiological indicators - 4.0%; chemical indices - 5.0% 39) Introduction of recognized closed-water management systems, generally accessible for swimming (swimming pools, spas), for all closed waters 40) Registration of substances and materials for treatment and disinfection of water; 41) Establishment of rules for the use of bathing water and the loading of water as a result of bathing | Monitoring and control of water quality Introduction of recognized closed-water management systems, generally available for swimming (swimming pools, SPA), for all closed waters Availability of permits for materials for treatment and disinfection of water; Establishment of rules for the use of bathing water and the loading of water as a result of bathing | IIO, CERC ME RK | Until 2020 |

Area XVIII. Identification and remediation of particularly contaminated sites (Article 6, paragraph 2 (l))

Current situation

In Kazakhstan, much attention is paid to the protection of water bodies from pollution, including by reducing the proportion of contaminated areas in their coastal zone. In particular, in the legislation of Kazakhstan these issues are described in sufficient detail. In the practice of nature management, the requirements for creating water protection zones and strips are introduced everywhere. At the same time, the problem is not yet fully resolved.

To solve the problems, the following Indicators and Measures for the Target Area XVIII were developed (Table 2.22).

Table 2.22

Indicators and activities for the target area XVIII

| № | Index | Indicators | Events | Responsibles | Date |
|----|--|--|--|--------------------|---------------------------|
| 28 | Decrease in the share of the contaminated area near water bodies | 42) Increase in the proportion of sites where the measures to reduce pollution risks, which will be detected in the surveys - up to 100% have been implemented; 43) Ensuring the organization and arrangement of water protection zones and lanes on all water bodies | Inventory, environmental monitoring Conducting soil disinfection, reclamation of landfills formed near water resources and facilities | IIO, CERC ME RK | Until 2018 and constantly |

Area XX. Periodicity of publication of information on the quality of supplied drinking water and other waters relevant to the protocol (Article 6, paragraph 2 (n))

Current situation

The need for broad public involvement in access to clean water is a prerogative for effective implementation of activities. The potential in this case is sufficient provided that the planned, diverse and systematic publication of materials, reporting in the media, print and electronic publications, posting on the sites. Participation of non-governmental organizations, public leaders, activists in organized meetings, consultations, check-outs, studies and other formats of work with feedback will facilitate, supplement and improve the implementation of activities by government agencies. Transparency of investments, projects will allow rational use of allocated budgetary funds.

To implement this approach, the following indicators and activities in this area have been developed:

| № | Index | Indicators | Events | Responsibles | Date |
|----|---|---|---|---|------------|
| 29 | Raising awareness of the quality of drinking water and the sanitary and epidemiological situation in the Republic of Kazakhstan | 44) Publication of the state report on the sanitary and epidemiological situation in the Republic of Kazakhstan (section "Hygienic assessment of water bodies, water supply and public health") 45) Publication of the national report on the state of the environment 46) Publication of bulletins and other publications on the quality of water bodies 47) Publication of the national report in accordance with the requirements of the Protocol | Ensuring the publication and posting of information | CPPH MH RK, IIO, CERC ME RK, | Until 2020 |
| 30 | Public participation in achieving the targets | 48) Raising public awareness of the Protocol on Water and Health 49) Public participation in the preparation and improvement of the legal framework and policy documents related to the achievement of the targets 50) Public participation in water resources management in matters related to health through conferences, seminars, round tables and other events 51) Raising the level of knowledge about water management detail through educational programs and trainings 52) Public participation in the implementation of the Protocol on Water and Health by establishing a working group on the Protocol and participating in the preparation of national reports of the Republic of Kazakhstan | Public information campaigns on the relevance of targets and the Protocol on Water and Health | CCH and CS MID, IIO, CERC ME RK, ДЕI and MME, CWR MA RK | Until 2020 |